D4.1 Report on Case Studies

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## D4.1 Report on Case Studies

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# Executive summary

## Introduction

Polypharmacy, the prescribing of multiple medications, has been described as one of the most pressing prescribing challenges. Polypharmacy increases the likelihood of adverse effects, impacting significantly on health outcomes and healthcare resources. While traditionally polypharmacy has been described as taking 4-5 medicines at the same time, it has been recently suggested that, given the emphasis on evidence based practice, there should be a change in focus from inappropriate polypharmacy (inappropriate prescribing of too many medicines) to optimal polypharmacy (appropriate prescribing of many medicines).

**Project SIMPATHY**

Project SIMPATHY (Stimulating Innovation Management of Polypharmacy and Adherence in The Elderly) was created to address the issue of inappropriate polypharmacy. The aim of SIMPATHY is to stimulate and support innovation across the European Union (EU) in the management of polypharmacy and adherence in the elderly, with a specific focus on addressing inappropriate polypharmacy. The final outcome of the project will be a set of change management tools guiding the development of interventions in polypharmacy and adherence management that can be used by policymakers and health system administrators across the EU.

To achieve this goal, the consortium has set a programme of work which provided case studies in a range of different environments which will contribute to an EU wide benchmarking survey, both of which will be used to develop change management tools targeted at stakeholders who can influence and implement the necessary changes (Figure 21).

**Case study objectives**

The project SIMPATHY work plan devotes an entire work package (WP4) to case study investigation activities. Nine case studies were conducted in eight EU countries: Germany, Greece, Italy, Poland, Portugal, Spain (Catalonia), Sweden, and the UK (Scotland and Northern Ireland).

The objective of the research captured in the case studies was three-fold:

- Firstly, we wanted to understand why these programmes were developed in the form they exist (the underlying rationale);
• Secondly we wanted to understand and describe (map) what exists regarding polypharmacy programmes and;
• Thirdly, we wanted to understand how these programmes were developed, implemented, and sustained.

Methods
Mixed-method case studies in nine sites (Germany, Greece, Italy, Northern Ireland, Poland, Portugal, Scotland, Spain, and Sweden) evaluating local polypharmacy and adherence management were conducted. Data collection for the case studies consisted of three phases:

• Phase I—Desk review: A review of published documents (both grey literature and peer reviewed literature) describing the specific activities taking place regarding polypharmacy management and the systems, laws, and policies that support the programme.
• Phase II—Key informant interviews: Interviews with key experts to provide insight into the development, implementation, and maintenance of polypharmacy and adherence programmes.
• Phase III—Focus Group: Focus group with local experts to validate findings.

Recognised change management principles (Kotter’s Eight Step Process for transforming change) and normalization process theory (NPT) informed both the design of data collection tools and in analysis.

Results
What programmes emerged?
Programmes varied widely based on the geographic scope and the type of care setting they operated in (Figure 3). Overall five countries had programmes (Catalonia (Spain), Germany, Northern Ireland, Scotland, and Sweden). Four countries (Greece, Italy, Poland, and Portugal) had no programmes. Table 1 provides a brief overview of programme components, with more detail available in the annex (page 95).

Why do programmes develop?
Understanding why programmes do or don’t develop provides valuable lessons for policy makers and clinical leaders as they move to implement a polypharmacy programme. Key points on why polypharmacy programmes developed include the following:

• Increasing economic austerity, an ageing population, and increased complexity of care for older patients were common across all case sites.
• Programmes developed in response to these, but also in response to local policy concerns such as creating stronger intermediate care networks or a focus on medicines safety.
• Work force development and the changing role of pharmacists also played a role in programme development.
• Countries without programmes faced similar economic and demographic pressures, but acute economic stress prohibited the development any significant new initiatives.
**How were programmes developed?**

How programmes are developed and implemented is a complex and multi-layered question, but one that has significant implications for SIMPATHY. Many of Kotter’s change management steps including: creating a sense of urgency; building a guiding coalition; and forming a strategic vision played a critical role in how programmes did or did not develop. Key points on how polypharmacy programmes developed include the following:

- All countries with programmes and some without had a clear sense of awareness of the problem of polypharmacy.
- Baseline data describing the problem of polypharmacy and its implications on the health system were key to getting buy-in and creating urgency.
- Countries without programmes typically had less data quantifying the problem of polypharmacy, with many citing the need for more research at the local level.
- Professional, institutional, and health-system culture varied between countries with programmes and those without, with it being cited as either a facilitator or barrier to change.
- Change management planning is an important part of implementing a new initiative, but few countries identified explicit strategies.
- Most programmes originated in health systems where local government exercise some control over policy and practice decisions.
- Leadership is needed at both the management and clinical levels.
- Government policies and legislation specifically related to polypharmacy facilitate implementation, but are not essential to start a new or pilot programme.
- In the absence of specific polypharmacy policies, programmes may still be developed.
- Countries with no programmes have some policies in place that could provide support for future programmes, but these countries could also benefit from national guidance.

**How were programmes implemented?**

The question of how to implement a new polypharmacy management programme was a significant point in many of the case studies. Key points on how polypharmacy programmes were implemented include the following:

- Education is critical for the successful implementation of a polypharmacy programme, but university training is often lacking.
- Postgraduate training opportunities and requirements vary widely across Europe, influencing the type of programme that can be implemented.
- In many countries skills around interprofessional communication are lacking.
- A robust information and communication technology (ICT) system was a major facilitator to implementing a polypharmacy management programme. Shared patient records and population level indicators were especially important.
- Countries without strong ICT systems cited this as a major barrier to implementation.
- The addition of or reallocation of new resources is necessary for implementation.
• Linking polypharmacy management with contracts can incentivise uptake.
• Multidisciplinary teams are an integral part of polypharmacy management, but are challenging to implement.
• Good polypharmacy management will require professional roles to shift, but this can cause tension between professionals.
• Polypharmacy management cannot be added on top of existing work. Redesign of workflow is essential.
• Both process and outcomes need to be measured, with a focus on timely data for both clinicians and policy makers.
• Scaling at a large scale requires continued commitment and re-evaluation of each of these elements.

Lessons learned

An ageing population and its associated increase in chronic conditions are prompting health care systems to revise how care is provided, with an emphasis on social sustainability. The case studies collected here depict a diverse European scenario. Rich and developed approaches to polypharmacy (Scotland, Northern Ireland and Sweden), coexist with less developed ones (Germany, Catalonia) and sites where timid steps are taking place (Greece, Italy, Poland) or others where importance or priority is still part of incipient discussions (Portugal).

Why programmes emerge and develop

The emergence of polypharmacy programmes has roots in common challenges being faced by most European health care systems, such a shrinking economy, aging population and an increase in the demand for healthcare services.

• A moderately stressed economy prompts health systems to search for more cost-efficient alternatives, a severe economic downturn can freeze innovation in polypharmacy management.
• Nation-wide strategies that promote improvement of health services with a focus on the care of older people seem to be a useful springboard for new programmes.
• Nation-wide strategies with a narrower focus on safer use of medicines seem to be less capable to achieve a similar impact, although they can be a starting point.

How programmes develop

The perception of polypharmacy as a health problem precedes the development of any actions or policies.

• An important step is having the capacity of quantifying the problem and its impact at health system level, which depends on the existing capacity of information systems.
• Lack of local population data seems to deter the translation into action. Policy makers especially value local data, with an emphasis on both economic and clinical outcomes.

Receptiveness to a new approach in polypharmacy management depends on the prevailing organisational culture.
Countries with polypharmacy programmes seem to be more open to innovation, and those without tend to identify cultural barriers that impede innovation.

In countries without programmes, the potential for addressing polypharmacy was often allocated to individual professional groups and less in a teamwork approach.

Laws that govern healthcare delivery can influence this culture.

Within health system structures the possibilities of developing new policies, reallocating resources or creating new practice models largely vary.

Polypharmacy programmes develop and grow in those systems that allow certain amount of local control while still keeping some central authority.

Development and implementation of polypharmacy programmes are complex tasks impacting individuals, organisations and the health system as a whole.

Countries with deliberated change management plans are more successful in incorporating polypharmacy programmes; their importance is also perceived in countries without programmes.

The development of a new programme requires gathering support from people (professionals and stakeholders impacted by the programme) and from government (policies and laws).

Legislation specific to polypharmacy is not common but can be very effective; policies that endorse polypharmacy can also be equally effective in promoting change.

In countries with no programmes, policies related to polypharmacy are not available but other existing policies could be used to leverage support for future initiatives.

Upfront investment is required to develop appropriate management of polypharmacy to cover the costs of developing and evaluating the new initiative as well as the costs of initial and ongoing training.

Programmes with less financial support tend to be more limited or less extendible.

**How were programmes implemented?**

Education, per se, does not guarantee the appearance of polypharmacy programmes, but the type of education available in a country aligns with the type of programmes that develop.

University training has significant variation among countries and only a few of them have introduced specific topics on polypharmacy in their curriculums.

In countries where polypharmacy is not part of the curriculum, university training appears insufficient for pharmacists, especially as it relates to providing clinical services and direct patient care.

Postgraduate training, notably in the form of residency or mandatory continuing professional development, is key facilitator in the development of programmes.

The need for training on communication between physicians and pharmacist and multidisciplinary teamwork is often noted.

Scalability requires strong health information systems in place.

They are seen as key facilitators for the implementation, also permitting monitoring through primary patient data and recording of specific indicators.
• In countries without ICT systems these capacities do not exist and constitute a barrier to programme development.

Developing and implementing a new polypharmacy programme requires an initial investment, notably in the form of workforce reallocation, but also to ensure specific funding with the purpose of driving the change.

• Amongst countries without programmes, the need for funding and remuneration for new services was particularly noted.

• A redefinition of the role of pharmacists was seen in many programmes, but the manner in which pharmacists were used varied both within and between countries.

• Contracts with providers, usually under the format of pay for performance, are common and provide legitimacy as well as funding.

The creation of multidisciplinary teams is a must to address polypharmacy management.

• There is a need to define the profiles and responsibilities of professionals on the team.

• Existing hierarchical structures and the creation of personal relationships are commonly reported barriers in countries without a programme.

Integration of polypharmacy in the existing daily practice requires a reallocation of time versus adding additional tasks on to an already full work schedule.

All countries, regardless whether they have or do not have a programme, agree with the importance of monitoring process and outcome indicators to evaluate polypharmacy programmes. There was also clear agreement of the difficulties that such evaluation presents.

• Process of implementation was identified as an important but difficult task, partially due to the lack of reliable indicators or instruments.

• A large variety of outcome indicators exist grouped around some common themes, such as quantity or quality of prescribed medicines, control of chronic disease, and hospital readmission rates.

• Economic evaluation has played a major role in the scaling up of the programmes.

The scale-up of polypharmacy programmes is difficult and maintaining the momentum is problematic as other priorities emerge.

One fact that became clear when examining programmes and how they were developed and implemented was the time that was needed. Reasonable expectations should be set regarding the pace and scale of change they expect to see.

Conclusion

Although countries across the SIMPATHY Consortium identified similar challenges facing their healthcare systems and largely agreed on the importance of addressing polypharmacy, approaches to addressing the issue varied greatly across the Consortium. The experiences and insights from these case studies combined with the literature review and benchmarking survey will provide the necessary information for the development of future change management tools. These tools will help stimulate innovation and enable health systems across Europe to create polypharmacy management programmes that address their local needs, creating healthier populations and more sustainable health systems.
2 | Introduction

Project SIMPATHY (Stimulating Innovation Management of Polypharmacy and Adherence in The Elderly) was created to address the issue of inappropriate polypharmacy (see box on this page, Polypharmacy and its consequences). The aim of SIMPATHY is to stimulate and support innovation across the European Union (EU) in the management of polypharmacy and adherence in the elderly, with a specific focus on addressing inappropriate polypharmacy. The final outcome of the project will be a set of change management tools guiding the development of interventions in polypharmacy and adherence management that can be used by policymakers and health system administrators across the EU. Representing ten institutions in eight countries, the SIMPATHY Consortium is made up of healthcare policymakers, practising clinicians, pharmacists, health economists, professionals responsible for large data base evaluation, and leading academic researchers. This multidisciplinary team will facilitate the development of a range of tools and strategies that will meet the needs of stakeholders throughout the EU.

To achieve this goal, the consortium has set a programme of work which provided case studies in a range of different environments identifying the framework and politico-economic basis for an EU wide benchmarking survey and development of contextualised change management approaches and tools to address the questions of concern to the target stakeholders who can influence and implement the necessary changes (Figure 2).

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**Polypharmacy and its consequences**

**Polypharmacy** is the prescribing of multiple medications. It has been described as one of the most pressing prescribing challenges. Polypharmacy increases the likelihood of adverse effects, impacting significantly on health outcomes and healthcare resources.

While traditionally polypharmacy has been described as 4-5 medicines, it has been recently suggested that, given the emphasis on evidence based practice, there should be a change in focus from **inappropriate polypharmacy** (inappropriate prescribing of too many medicines) to **optimal polypharmacy** (appropriate prescribing of many medicines).

There is a wealth of recent evidence of the extent and impact of inappropriate polypharmacy on the elderly. Amongst the elderly, polypharmacy has been shown to predict hospitalisation, nursing home placement as well as other negative health outcomes like fractures and pneumonia. Data from EU nursing provides some evidence of the extent of polypharmacy in Europe; half of nursing home residents take 5-9 medicines and a quarter take 10 or more medicines at the same time.
Carefully targeted and comprehensive dissemination and engagement activities will be deployed to stimulate and support the innovation necessary to address this major EU healthcare challenge. The overall project aims are to:

1. Produce case studies illustrating the range of development status of polypharmacy and adherence management in the elderly in different EU member states
2. Benchmark current healthcare models and practices for management of polypharmacy and adherence across the EU
3. Develop knowledge sharing networks and resources to support policymakers and healthcare providers through the innovation and change management process to realise best practices
4. Exchange of best practices on management of polypharmacy and adherence in the elderly population
5. Address barriers to innovation in multi-disciplinary healthcare provision in the context of management of polypharmacy
6. Support the dissemination of evidence based care models, expertise and best practice
7. Influence and drive change in healthcare practice and policy to deliver better health outcomes from medicines use in the elderly across the EU

**SIMPATHY case study objectives**

In order to achieve the project aims, it is first necessary to understand the current landscape of polypharmacy and adherence management programmes and supporting policies in the EU. The SIMPATHY consortium is composed of countries within a range of European Innovation Partnerships Active Healthy Aging (EIP AHA) reference sites. Given the range sites, we anticipated that we would find a variety of polypharmacy management programmes, from small pilot studies to fully implemented government sponsored programmes. Programmes at every stage of development would provide valuable information for the development of change management tools.

The project SIMPATHY work plan devotes an entire work package (WP4) to case study investigation activities. The aim of this work package was to understand what types of programmes have been developed to meet the needs of older patients with polypharmacy within different health delivery systems across SIMPATHY consortium by mapping the structure, process, and outcomes of policies and practices at the national, regional, and institutional levels. Nine case studies were conducted in eight EU countries: Germany, Greece, Italy, Poland, Portugal, Spain (Catalonia), Sweden, and the UK (Scotland and Northern Ireland).

The objective of the research captured in the case studies was three-fold:

- Firstly, we wanted to understand why these programmes were developed in the form they exist (the underlying rationale);
- Secondly we wanted to understand and describe (map) what exists regarding polypharmacy programmes and;
- Thirdly, we wanted to understand how these programmes were developed, implemented, and sustained.

These three issues will provide key information for other SIMPATHY work packages (notably WP 5 on policy and change management; and WP6 on European strategies of polypharmacy and non-adherence management in elderly) and activities (the Delphi study that will validate recommendations and policies) as they move forward developing the tools and materials to stimulate innovation throughout the EU.
A note on case study methodology

Case study investigation uses a range of different methods ‘to explain present circumstances’ through an ‘in-depth description of social phenomenon.’\(^1\)\(^,\)\(^2\) In the case of SIMPATHY this means not just examining the specific components of a medication review within a polypharmacy management programme, but also looking at other factors that facilitated the development and implementation of these programmes such as organisational culture, economic imperatives, and management strategies.

It is important to note that this exercise was not meant to evaluate the effectiveness or efficacy of these programmes or to determine which practice is a best practice. The goal was to identify core components of existing programmes as well as the drivers and barriers to implementation, providing the foundation for the development of change management tools.

Structure of this document

The contents presented in this document are intended for a wide audience, encompassing policy makers, managers, professionals, professional associations, patient advocates and patient associations and general public. Therefore the document uses non-academic language. In addition to this document, the individual nine full case study reports are available upon request.

This document is composed of the following three sections:

- **Section 2 Methods:** The methods followed to conduct the case study investigation are briefly presented in this section. It includes the criteria for selecting the case studies, the process of data collection and its time plan and the conceptual and the frameworks and theories that informed the analysis of data.
- **Section 3 Results:** This section presents the findings collected from the nine case studies grouped in four main subsections: what polypharmacy programmes emerged; why programmes do or don’t develop; how they were developed; and how programmes were implemented.
- **Section 4 Lessons learnt:** This section summarises the results presented in section 3 highlighting the main messages across all the case studies.

Two annexes complement the document: Annex 5.1 includes the summaries of the nine case study reports and annex 5.2 includes the country data profiles (2013/2014).

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3 | Methods

Mixed-method case studies in nine sites (Germany, Greece, Italy, Northern Ireland, Poland, Portugal, Scotland, Spain, and Sweden) evaluating local polypharmacy and adherence management were conducted. Case study methodology is a systematic set of procedures that provides an in-depth understanding of a specific event, in this situation the development and implementation of polypharmacy and adherence programmes. An aspect of case study research that makes it particularly appropriate to the goals of SIMPATHY is that it allows the researcher to examine the context surrounding the case. In the case of SIMPATHY this means not just examining the specific components of a medication review, but also looking at other factors that facilitated the development and implementation of these programmes such as organisational culture, economic imperatives, and management strategies.

Case study definition

Each case study team identified the programme that would be evaluated within their country. Programmes focusing on polypharmacy or medicines management in the elderly were of highest priority. If this did not exist then a general polypharmacy management programme was included. If no programme could be identified, the case study focused on the relevant policies, practices, and legislation that would influence a future polypharmacy.

Data collection

Data collection for the case studies consisted of three phases:

- Phase I—Desk review: A review of published documents (both grey literature and peer reviewed literature) describing the specific activities taking place regarding polypharmacy management and the systems, laws, and policies that support the programme.
- Phase II—Key informant interviews: Interviews with key experts to provide insight into the development, implementation, and maintenance of polypharmacy and adherence programmes.
- Phase III—Focus Group: Focus group with local experts to validate findings.

To identify grey literature related to the programme, researchers worked with a representative from the institutions involved in the polypharmacy programme to ensure all relevant documents were included.

Polypharmacy programmes are complex interventions, and past reporting on these interventions has suffered from unclear descriptions of the intervention. In order to clearly articulate not only the components of each programme but also the strategies used in development and implementation, both the data collection and the data analysis were informed by multiple frameworks and theories.

A modified version of the Template for Intervention Description and Replication (TIDieR) checklist was used in the description of programmes was used to define programme components.

Kotter’s Eight Step Process for transforming change was used to assess and evaluate change management strategies. Kotter’s process for leading change originates in the private business

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sector, but has been applied to multiple settings including in the implementation of new health care services. The process consists of: creating a sense of urgency; building a guiding coalition; forming strategic vision and initiatives; enlisting volunteers; enabling action by removing barriers; generating short term wins; sustaining acceleration; and instituting change.

Normalization Process Theory (NPT) was used to assess implementation. NPT helps explain how organisations bring a process into practice—how a new idea becomes imbedded in the daily lives of clinicians take care of patients. It breaks down the process of operationalising and imbedding a new practice into four constructs: i) coherence, or how people understand a new idea, ii) cognitive participation, or how people work together to create relationships and communities around a new practice, iii) collective action, or the work people do to enact a new practice and iv) reflexive monitoring, the process of evaluating how the new practice affects their own work and the work of the organisation.

The desk review data collection guide was informed by all of the above, and the interview guide was informed primarily by Kotter and NPT. The interview was semi-structured and each research team was free to adapt the questions to both the programme and to the expertise and qualifications of the interviewee.

**Data analysis**

Data were analysed at the country or programme level and then at the aggregate level. In order to create consistency, each research team used a predefined set of codes based on Kotter and NPT. Major themes within these codes were identified and are included in this report.

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4 | Results

The results presented in this section summarise the major findings of the nine case studies, combining the desk review, key informant interview, and focus group data. The findings have been grouped around the major objectives of the case studies. Section 4.1 outlines what types of programmes were identified within the case studies and includes recommendations from countries without programmes on what should be included in a new polypharmacy management initiative. Section 4.2 describes why programmes did or did not develop, including demographic and economic pressures as well as other complementary or competing health policy initiatives. Finally, section 4.3 describes how programmes were developed, implemented and scaled up. This includes a broad range of topics from the influence of organisational culture to what types of payment systems were introduced to support implementation. Where applicable, NPT constructs and steps from Kotter have been identified within the text. In addition to the data related to Kotter and NPT, there were also a number of important themes that emerged that did not fit well within any of the predefined codes. These primarily dealt with the infrastructure and context that the programmes were developed in and are mostly included in sections 4.1 and 4.2. To guide the reader, each section opens with a box highlighting major findings and closes with a summary table of specifics on each country.

4.1 What programmes emerged?

Identifying what types of programmes currently exist will provide important information for countries that are developing new polypharmacy management programmes as well as for countries with existing initiatives. Based on the specific pressures facing the healthcare system, existing resources, and the political, social, and cultural environment within a particular setting, various types of polypharmacy and adherence programmes were identified within the Consortium. Overall five countries had programmes sufficiently developed for inclusion (Catalonia (Spain), Germany, Northern Ireland, Scotland, and Sweden). Four countries (Greece, Italy, Poland, and Portugal) had no programmes or policies related to polypharmacy, although Poland is in the process of developing a medicines use policy that will most likely address polypharmacy. Table 1 provides a brief overview of programme components, with more detail available in the annex (page 95).

Programmes varied widely based on the geographic scope and the type of care setting they operated in (Figure 3). Two countries, Germany and Northern Ireland, had programmes that were not designed to specifically address polypharmacy, but included it within the scope of their respective activities. The scope of identified programmes ranged from small local pilots to fully developed national initiatives. There was also a wide diversity of practice setting including every stage of healthcare delivery from community pharmacists to in-patient geriatric units.

A note on language

The term “programme” is used throughout this document as a general way to describe all polypharmacy and adherence initiatives which include official government programmes or local initiatives.
Although almost half of the SIMPATHY consortium had no existing programmes or policies related to polypharmacy, through the key informant interviews and focus group discussions details on what stakeholders in these countries think a programme should look like were identified. The criteria were very similar to those already used in countries with existing programmes. In general, most agreed that a programme should target the elderly (typically over age 65) and more specifically, that it should focus on the older people with frailty and also those of any age with multiple chronic conditions. There was also agreement that a multidisciplinary approach should be employed, with physicians and pharmacists as the most commonly mentioned health professionals mentioned, although the role of nurses was also noted by Italian stakeholders. Multiple settings for the programme were mentioned including community pharmacies, primary care, and hospitals. In Poland and Greece community pharmacies were seen as a particularly important place to address polypharmacy.
Table 1 Summary of SIMPATHY case study programmes

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<tr>
<th>Country</th>
<th>Setting</th>
<th>Patients Targeted for Intervention</th>
<th>Health Care Provider</th>
<th>Programme Objectives</th>
<th>Description of Activities</th>
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| Catalonia<sup>b</sup> | Primary care | Meet health system definition of complex chronic disease | Primary care physicians | Improve 1) Patient safety and reduce drug related problems; 2) health outcomes and control of chronic disease; 3) Adherence and; 4) Healthcare quality and patient quality of life. | • Complex chronic patients flagged in electronic medical record  
• Physicians required to review all flagged patients according to guidance published by the Catalan Health Department |
|         | Institutional | Admitted to acute geriatric unit | Geriatrician and hospital pharmacist | Improve global patient health and well-being, especially | • Therapy goals established with patients and families  
• Pharmaceutical care plan developed accounting for specific diagnosis, the indication of each medication (therapeutic, primary prevention or secondary prevention), and the life expectancy of the patient  
• Care plans shared via fax or verbally with primary care physicians |
| Germany | Community pharmacy | Determined by pharmacists but usually ≥ 5 medications and ≥ 60 years old | Community pharmacist | 1) improve efficacy of pharmaceutical care; 2) minimise drug risks; 3) improve adherence and; 4) communicate findings with physicians | • Pharmacists choosing to participate undergo training through their professional organisation sponsoring the activity  
• During two separate visits pharmacists conduct medication review including adherence counselling  
• Results are communicated to patients who may choose to share these with their physician |

<sup>a</sup> A pilot programme was mentioned in the Polish case study but not enough information was included to describe it here; <sup>b</sup> Two different programmes were identified in Catalonia, a government sponsored primary care model and an institutionally sponsored model including inpatient hospital care, long-term care and nursing homes; <sup>c</sup> includes step-down facilities providing time-limited services geared towards reducing prolonged hospital stays and promoting independence; <sup>d</sup> Scotland has estimated the risk of emergency hospital admission for its population; <sup>e</sup> Sweden has national legislation mandating medication reviews take place but the setting is determined by local health authorities depending on their resources and need
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<tr>
<th>Country</th>
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<th>Programme Objectives</th>
<th>Description of Activities</th>
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<tbody>
<tr>
<td>Northern Ireland</td>
<td>Intermediate care</td>
<td>Admitted to intermediate care</td>
<td>Case management and consultant pharmacists</td>
<td>Develop, test and scale up a Regional Model Medicines Optimisation in Older People</td>
<td>• Pharmacists working in intermediate care setting are supported by a senior consultant pharmacist in developing patient-centred pharmaceutical care plan</td>
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<td></td>
<td>• Medicines adherence assessed</td>
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<td>• Care plans communicated with general practitioner</td>
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<td>• Patient followed by pharmacist post-discharge for up to 30 days</td>
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<tr>
<td>Scotland</td>
<td>Care homes, Primary care</td>
<td>• All patients in care homes aged 50 or older&lt;br&gt;• Patients 75 and older, on 10 or more medicines (one must be high risk) and at high risk for hospital admission</td>
<td>Pharmacists and physicians in primary care</td>
<td>Systematically address inappropriate polypharmacy and adherence across Scotland in order to minimise harm, optimise benefits, reduce hospitalisations and medicines waste</td>
<td>• Apply medication review according to processes outlined in National Polypharmacy Guidance&lt;br&gt;• Guidance addresses establishing shared treatment goals, evaluating value of medicines based on number needed to treat, balances disease state recommendations with life expectancy, and adherence</td>
</tr>
<tr>
<td>Sweden</td>
<td>Multiple</td>
<td>Patients aged ≥ 75 with 5 or more prescription drugs</td>
<td>Physicians or clinical pharmacists</td>
<td>Increase and ensure the quality, safety and sustainability of the pharmaceutical care, focusing on polypharmacy in the elderly.</td>
<td>• Guidance and tutorial on performing medication reconciliation and comprehensive medication reviews published by the National Board of Health and Welfare, although application is optional&lt;br&gt;• Goal of guidance is to optimise the patient’s medication treatment and to minimise the incidence of drug-related problems.&lt;br&gt;• Changes made based on guidance are communicated orally and in writing to patients and other healthcare providers</td>
</tr>
</tbody>
</table>

a) A pilot programme was mentioned in the Polish case study but not enough information was included to describe it here; b) Two different programmes were identified in Catalonia, a government sponsored primary care model and an institutionally sponsored model including inpatient hospital care, long-term care and nursing homes; c) Includes step-down facilities providing time-limited services geared towards reducing prolonged hospital stays and promoting independence; d) Scotland has estimated the risk of emergency hospital admission for its population; e) Sweden has national legislation mandating medication reviews take place but the setting is determined by local health authorities depending on their resources and needs.
4.2 Why do programmes develop?

Understanding why programmes do or don’t develop can also provide valuable lessons for policy makers and clinical leaders as they move to implement a polypharmacy programme in their own country. Common challenges including economic pressure and an ageing population were faced by almost all SIMPATHY consortium members (Figure 4), but unique pressures influencing the scope and scale of programmes were also identified. Table 2 at the end of this section provides specifics for each case study.

**Economic pressure**

Either within the desk reviews, key informant interviews, or focus groups all case study partners identified some similar challenges facing their healthcare systems. All cited an increasing pressure to utilise resources more efficiently brought about both by a growing older population requiring a complex mix of healthcare resources and by the economic crisis starting in 2008. In many countries, spending on healthcare is growing faster than the overall economy. Between 2008 and 2013 Germany, Spain, and Poland all saw averages increases in healthcare spending that were greater than the average growth of their gross domestic product (GDP) and Greece, whose GDP declined during this period saw that the decline in healthcare spending was slower than rate of decline in the GDP. Only Italy and Portugal had GDPs that grew significantly faster that the growth of spending on healthcare, most likely due to severe austerity measures taken in those countries.

**Demographic changes**

Data reviewed as part of the desk review highlights that across the EU and within the SIMPATHY consortium populations are getting older. This is occurring due to both increasing life span and decreasing numbers of younger people. Concern about an ageing population, including their higher rates of multimorbidity and high rate of healthcare utilisation, was specifically mentioned within almost all of the case studies either within policy documents in the desk review or by key informants. As one Catalan hospital pharmacist said, “we have to start asking ourselves how we are going to treat [the geriatric population] which will be much larger in 30 years.” The trends of an ageing population affect each country in a slightly different way. For example Poland currently has a lower percentage of people over age 65 compared to other SIMPATHY countries, but also faces the fastest rate of change in terms of age distribution, creating an urgent need to address the needs of an older population now.
Figure 4 Factors driving the need for polypharmacy management

Initiatives that support programme development

In addition to the common pressures on healthcare systems, the programmes identified within the SIMPATHY consortium also reflect the unique priorities of individual countries. Polypharmacy management programmes were not designed in a vacuum, but within the context of larger health policy initiatives. They also often coincided with the goals of professional organisations to expand the scope of practice, something that was especially true for pharmacists.

A strong focus on older people stimulates medicines management

The polypharmacy legislation and medication review guidelines in Sweden emerged within the context of a larger national movement in the early 21st century when there was, “much focus on care for the elderly (professor of geriatric pharmacology),” by the government. This included a nationwide programme to develop long-term strategic changes improving care in hospital, primary care, and community settings as well as the development of national quality indicators for pharmacotherapy in the elderly. These activities were predated by an initiative in the 1990’s utilising multidisciplinary teams, including pharmacists, to improve drug therapy for nursing home residents.

Similarly, the confluence of various policy initiatives combined to support the development and implementation of the Northern Ireland pharmacist consultant model in intermediate care. As was the case in Sweden, there was a strong focus on improving care for older people in Northern Ireland as illustrated by the publication of multiple strategic planning documents including the National Service Framework for Older People published in the start of the 21st century as well as more recent ‘Transforming Your Care’ published in 2011. The latter called for better integration of community and hospital care, especially for older people. In parallel, there was also a focus on developing the role of pharmacists.

“It is an area where pharmacists can positively position themselves as a healing professional.”

German community pharmacist
pharmacists in the NHS. There was a strategic plan to make pharmacists a “strong integral part” of healthcare delivery, with the specific role of a consultant pharmacist identified as one way to do this. These two priorities, improving care for the older population and improving the role of pharmacists in care delivery, combined when a “huge gap” in pharmacy services at the intermediate care level was identified.

**Medicines safety and workforce development**

Germany also saw a combination of factors supporting the development of the community pharmacy model. These included a focus on improving the safe use of medicines at the national level, as well as a desire to expand the pharmacist’s role in providing pharmaceutical care in the community setting. As one community pharmacist manager said about the programme, “It is an area where pharmacists can positively position themselves as a healing professional,” illustrating the role the programme played in not just improving health for patients but in supporting the changing role of pharmacists.

Like Germany and Northern Ireland, workforce development and the changing role of pharmacists also played a role in the development of the Scottish polypharmacy management programme. In order to address future workforce challenges, the 2010 Healthcare Quality Strategy recommended an increased use of teamwork and optimisation of health care professionals’ skills. At the same time there was a focus on avoiding unplanned hospital admissions and optimising drug therapy to improve health outcomes. Finally, the strategic plan for pharmacy practice in Scotland, ‘Prescription for Excellence’ outlined a vision where patients would receive “high quality pharmaceutical care from clinical pharmacist independent prescribers.” The combination of these factors supported the continued development of the pharmacist prescriber primary care model. Importantly, polypharmacy management was looked at in the context of other changes happening in primary care. In the words of a senior pharmacist manager, “If polypharmacy had just sat as a standalone prescription project, it would have got lost among some of the other major changes that are going on...[polypharmacy management is] part of long term conditions management.”

**Polypharmacy in complex chronic disease**

In Catalonia, the primary care polypharmacy management programme stemmed directly from a broader initiative focused on improving care for patients with multiple complex chronic diseases, which was a priority established in the 2010-2015 Catalan Health Plan. The rational use of medicines in patients with complex chronic disease, which includes the management of polypharmacy, was one of six specific lines of work developed as part of this initiative. The institutional programme in Catalonia was also part of a larger, although less formal, focus on improving the quality of geriatric care with a “global vision” of the patient.

**Countries without official programmes**

Earlier it was noted that countries across the SIMPATHY consortium members face similar economic challenges and demographic changes. Why then did some countries respond by developing new initiatives while others did not? One issue may be the level of pressure—especially economic.
Whereas slight or moderate economic pressure on a system might have been seen as an opportunity to create a new practice model, extreme economic pressure does not yield the same response. Of countries with no existing programmes identified, Greece, Italy, and Portugal, all cited short term financial concerns as negatively affecting their ability to invest in newer more forward looking programmes, such as polypharmacy management programmes.

**Focus on short term savings**

In the case of Greece, healthcare spending has dropped annually since 2009, with double-digit reductions between 2010 and 2012 resulting in spending levels 25% lower than 2008 levels. According to a Greek hospital pharmacist, “the main goals for the hospital are financial,” and not the development of new initiatives. In spite of the lack of official government initiatives, some activities related to improved pharmaceutical care, which should in theory address inappropriate polypharmacy, are ongoing. The Hellenic Society of Pharmaceutical Practice has created tools for pharmacists, particularly community pharmacists, which facilitate medication reviews and record keeping. These services depend on the individual pharmacist choosing to provide them and there are no reimbursement mechanisms. Italy has also suffered from the global economic crisis, where across the board budget cuts in health and freezes on infrastructure spending have exacerbated existing inequities between different regions. This has particularly affected the ability of southern regions to invest in health promotion and prevention activities. The focus in Portugal has also been on short term cost cutting policies. In order to promote efficient use of medicines, a national formulary has been developed in recent years outlining the preferred choice of medicines. In the words of Portuguese pharmacists there have also been “attempts to guide medication [selection] in a more organised way” through the development of clinical practice guidelines. Ironically, both of these documents were developed as part of the bailout agreement between Portugal and the Troika (the European Commission on behalf of the Eurogroup, the European Central Bank and the International Monetary Fund), but neither address the issue of comorbidity and may actually serve to increase inappropriate polypharmacy and therefore create inefficiencies in the Portuguese healthcare system.

**A rapidly ageing population with limited health spending**

Poland, another country without a programme, was not affected by the economic crisis in the same way as other EU countries were. Instead, competing health priorities, like long wait lists for general or specialty care, were provided as reasons why polypharmacy management had not been addressed. That being said, healthcare spending is becoming a major priority in Poland. Between 2006 and 2016 the healthcare budget almost doubled (€8.5 billion to €16.1 billion), but Poland still spends the least per capita of any SIMPATHY country (€1,530 versus 3,234 in the UK or 4,904 in Sweden). Compared to other SIMPATHY countries, Poland also spends the second highest percentage of healthcare costs on pharmaceuticals (21.6%) with only Greece spending more (30.5%). It is within this context that the Ministry of Health Directive has established a working group to develop “a project of pharmaceutical care which will be subject to public funding,” that could, in theory, address polypharmacy.

Other factors such as including organisational and professional culture, workforce capacity, and the availability to quantify and monitor the issue of polypharmacy may have also contributed to the development, or lack of development, of polypharmacy programmes. These will be addressed in the following section on how programmes are developed and scaled up.
<table>
<thead>
<tr>
<th>Countries with Institutionally or Governmentally Supported Programmes</th>
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| **Catalonia (Spain)** | Primary care programme: National focus on improving care of patients with complex chronic conditions  
Institutional programme: General focus on improving holistic care of patients via multidisciplinary teams |
| **Germany** | National focus on safe use of medicines; desire of pharmacy organisations to promote clinical role of pharmacists; to a lesser extent projected shortage of general practitioners |
| **Northern Ireland (UK)** | National focus on care of older people including better integration of community and hospital care; movement to expand role of pharmacists in NHS with consultant pharmacists identified as a strategic priority |
| **Scotland (UK)** | National focus on guideline development to review appropriate prescribing guidelines for those with multiple morbidities with expanded focus on treating chronic conditions, frail older people, and those at the end of life. Projected national workforce shortages promoting need to expand role of other health care providers; avoiding unplanned hospitalisations; |
| **Sweden** | National focus on improving care for elderly including development of quality prescribing guidelines; pilot programmes in nursing homes with multidisciplinary teams and; changes in pharmacy education promoting clinical pharmacy |

<table>
<thead>
<tr>
<th>Countries with no Identified Programmes</th>
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<tbody>
<tr>
<td><strong>Greece</strong></td>
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<td><strong>Italy</strong></td>
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<td><strong>Poland</strong></td>
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<td><strong>Portugal</strong></td>
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Table 2 Why Programmes develop: economic factors and concurrent health policy initiatives
4.3 How were programmes developed?

How programmes are developed and implemented is a complex and multi-layered question, but one that has significant implications for SIMPATHY. The question of ‘how’ relates to the planning and development phase, which includes steps like strategic planning, obtaining buy-in from policy makers and end users, creating a vision, and conducting baseline measurements. ‘How’ also refers to how a programme or initiative was actually implemented. What training was required? Was the workflow reorganised to accommodate the change? How did the roles of participants change with the new programme? Finally, the question of ‘how’ also refers to the scaling up process. Many programmes started as local initiatives at the county or board level. How did these programmes move from local pilot projects to regional or national movements? Many of Kotter’s steps including: creating a sense of urgency; building a guiding coalition; and forming a strategic vision played a critical role in how programmes did or did not develop.

The type and level of support, including legal, political or financial, also played a role in how a programme developed. Two key elements: organisational culture and the health system structure itself, also emerged throughout the case studies as mediators of change with a significant influence on how polypharmacy programmes were developed. Key findings are summarised in box on this page and country specific findings are in Table 3.

Creating awareness and urgency around polypharmacy

*Data helps create urgency*

Generating a sense of urgency is one of the first steps described by Kotter in leading change. The shared sense of urgency helps create the momentum necessary to start the change management process. All countries with a programme, and some without, demonstrated an awareness of the problem of polypharmacy. Data played a significant role in generating a sense of urgency. Catalonia, Sweden, and Scotland, all had systems and indicators in place to quantify the extent of polypharmacy and its implications for the health care system. These helped create a sense of urgency around the issue of polypharmacy management. Both Scotland and Catalonia had population level indicators

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**Key Points**

*All countries with programmes and some without had a clear sense of awareness of the problem of polypharmacy.*

*Baseline data describing the problem of polypharmacy and its implications on the health system were key to getting buy-in and creating urgency.*

*Countries without programmes typically had less data quantifying the problem of polypharmacy, with many citing the need for more research at the local level.*

*Professional, institutional, and health-system culture varied between countries with programmes and those without, with it being cited as either a facilitator or barrier to change.*

*Change management planning is an important part of implementing a new initiative, but few countries identified explicit strategies.*

*Most programmes originated in health systems where local government exercise some control over policy and practice decisions.*

*Leadership is needed at both the management and clinical levels.*

*Government policies and legislation specifically related to polypharmacy facilitate implementation, but are not essential to start a new or pilot programme.*

*In the absence of specific polypharmacy policies, programmes may still be developed.*

*Countries with no programmes have some policies in place that could provide support for future programmes, but these countries could also benefit from national guidance.*
specific to polypharmacy as well as data on control of chronic diseases and, in the case of Scotland, data on medicines related hospital admissions. In Sweden, national quality prescribing indicators for the elderly were cited by a geriatrician and co-author of the national guidelines on medication reviews as critical for obtaining support for their polypharmacy initiative: “One of the most important things is to start measuring drug use, to get a view of the situation and make healthcare professionals aware of the problem of inappropriate polypharmacy.” Although Northern Ireland did not have any specific polypharmacy indicators, they had population level data around medicines use and medicines related hospital admissions which informed their policy development.

Some programmes, such as the community pharmacy initiative in Germany and the institutional programme in Catalonia were initiated in the absence of clear data defining the problem, but instead with a sense of the larger pressures on the healthcare system and the need to generally provide better pharmaceutical care management. According to a Catalan hospital CEO, “There are issues that are so clear that when it comes time to implementing an improvement in our polypharmacy policy there was no need to discuss it further.”

Countries without programmes often lack data

Although there was a sense of awareness of the issue of polypharmacy in countries without programmes, this had not moved to a sense of urgency prompting action on the issue. Among the countries without programmes, Poland and Portugal have no systems in place to monitor polypharmacy on a national level. Greece has recently introduced national electronic prescribing which allows them to identify polypharmacy, but it does not provide data on the appropriateness of therapy or allow them to monitor the implications of polypharmacy, which is critical for creating urgency. Both Italy and Poland noted the existence of a central database of dispensed prescriptions, but currently neither one of these is being used to monitor polypharmacy or adherence. Physicians in both Portugal and Italy expressed the need for more data on polypharmacy that would help clarify the problem and demonstrate the importance of the issue to decision makers. According to a Portuguese physician, data would “help us identify the population, and identify the risk factors [for polypharmacy],” and to be able to show policy makers “the figures in practical terms of costs associated with polypharmacy.” An almost identical sentiment was expressed by an Italian physician: “Polypharmacy and adverse drug reaction result in increased use of emergency room admission with relative increase in cost or length of stay. Studies on inappropriateness of prescriptions could support government decisions.” Interestingly, Italy does have a series of national health outcome indicators that could potentially be linked to a polypharmacy or medicines management programme, but these are currently not used in this way.
Economics—an important but not a primary selling point

Although economic pressure was a general motivating factor in developing these programmes, it is important to note that both in countries with and without programmes, economic arguments were not seen as an effective means to gain support from clinicians. In fact, many participants agreed that if it was sensed that a programme was motivated only by economics it would backfire. In Greece it was noted that if cost saving was the only motivation, clinicians will be “unwilling to comply” with a new initiative. Similarly, in Scotland a policy maker said, “they [clinicians] want to be sure it’s not driven around cost and it’s about clinical benefit.”

Media and education campaigns

Both Scotland and Sweden had concerted education campaigns to generate a sense of urgency around polypharmacy. In Sweden, videos of patient cases outlining the impact of polypharmacy were used to create awareness. The national media eventually used these videos which were cited as “very important in creating awareness of the need for change.” Key informants in Poland also noted that a new programme “should be preceded by media campaign.” Scotland, there was a significant effort made to reach out to a wide range of different health care providers through professional meetings and national NHS events. Health system administrators responsible for local regions (boards) were also targeted. Getting buy in from these leaders helped reach the health care providers within each region.

The role of organisational culture in developing programmes

Prior to programme development and implementation, organisations need to be ready to accept the new initiative. This means that members see the need for the innovation and that it fits with their individual, professional, and organisational cultural norms. Organisational culture is complex, and includes the values, assumptions, and beliefs held by those within that organisation. In the case studies the concept of organisational culture arose at the level of the health system, individual institutions, and also within professions and influenced how programmes developed and what was eventually implemented. Although the ideas of culture overlaps with some concepts in both NPT and Kotter (for example it could be argued that it relates to the NPT construct of coherence, as organisational culture influences how people understand an intervention), in the course of analysing the case studies it stood alone as something that preceded and laid the foundations for how people understood and approached the issue of polypharmacy management. Depending on the case study, organisational culture was seen as either a facilitator or barrier to the development and implementation of a new polypharmacy management programme.

Culture can promote or hinder innovation

There was general agreement across case studies regarding awareness of polypharmacy, but with the issues of culture, there was a greater split between countries with programmes and countries without. In general, countries that had existing programmes demonstrated that they were open and willing to accept new ways of delivering healthcare, whereas countries without programmes

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identified more cultural barriers to implementing a new polypharmacy programme. For example, Northern Ireland, a country with an innovative pharmacist consultant practice, describes itself as “outwardly-focused” with a “keen interest in the work of quality and safety bodies elsewhere in the United Kingdom.” Likewise, in Germany, the community pharmacy initiative built on existing practices and was in line with the goals of the professional organisations to expand the role of pharmacists into providing more clinical services. At an institutional level, the hospital CEO in Catalonia where a multidisciplinary geriatrics team manages polypharmacy, described his job as “managing innovation” and that the institution had “a culture, a way of doing that greatly facilitates the implementation of these programs.” Interestingly, this same culture of innovation was not seen in the Catalan primary care model where, at the manager and practitioner level, there was a sense of following directions from central authorities expressed by one manager as, “the person who pays dictates...we don’t really question.”

The individual versus the team mentality

In Greece, where no concrete policy or initiative was identified, policy makers specifically noted that, “there is no sense of teamwork in healthcare.” and that “medical doctors are not accustomed to cooperation and collaboration.” A similar theme was echoed in Portugal and Poland, where individual professional groups could see their own strong potential for addressing polypharmacy, but expressed the sentiment more as an “us” versus “them” and not in the context of a multidisciplinary team. In Poland, one key informant stated that “physicians are unwilling to solve the issue when it is transferred [from a pharmacist], and a geriatrician declared that, “only they [geriatricians] are qualified enough to coordinate treatment of patient with multimorbidities and polypharmacy.” Both Italy and Portugal mentioned the isolated nature of prescribers as barriers to creating the multidisciplinary teamwork necessary for addressing polypharmacy.

Institutionalising organisational culture with policy

Laws governing how healthcare is delivered also create the cultural norms within which healthcare providers practice. Almost all of the countries in the SIMPATHY case studies exclusively allowed physicians to prescribe, with some allowing physician assistants or nurses limited prescribing authority (Poland and Spain). This creates a hierarchical culture where one person has authority over medicines management. The United Kingdom is unique in that it has both supplementary and independent prescribing for non-physicians. (Supplementary prescribing allows non physicians to prescribe as part of an established care plan with an independent prescriber.) The fact that prescribing is shared between a variety of different health care providers creates a practice environment of overlapping responsibilities and an expectation that multiple professionals will be involved in medicines management. Although a culture of shared decision making does not necessarily need to come from prescribing authority, legislation defining the scope of practice can also contribute to this culture. Work regulations in Germany stating that medication reviews are within the scope of practice of pharmacists facilitated the development of their programme. Italy also has legislation outlining the role of pharmacists in multipurpose centres, although this has not been implemented fully, indicating that legislation by itself is not sufficient to change culture.
Healthcare systems structures and their influence on programme development

Another factor that emerged in the analysis as underlying the development, or lack of development, of a polypharmacy management programme was the structure of the healthcare system. As with culture, the structure of the system did not lend itself to categorisation by either Kotter or NPT, but played an important role in how programmes were developed and implemented. Specifically, the existence of local governance models with power to make policy reallocate resources and create new practice models versus a strong central government dictating policy seemed to play a role in where and how programmes emerged.

The balance between local and central control

Within the SIMPATHY consortium, all of the existing programmes developed within healthcare systems where there is oversight by a central authority but a certain amount of control is ceded to local entities. This was usually around service delivery, payment, and incentive structures. In the case of Scotland, the current national policy was derived from programmes originating in regional health boards, and frontline practitioners were recruited to help develop national policy. In Sweden, innovative practice models in Uppsala County and the Skåne region helped spur the eventual adoption of national legislation mandating medication reviews for older patients with polypharmacy. Likewise, the Northern Ireland consultant pharmacist model was also initiated as a pilot within two health boards, with plans to scale up to all of health boards in the future. The German community pharmacy model was also developed within the context of regional chambers of pharmacy that administer and oversee the programmes. In Catalonia, both the institutional and the primary care models were developed within smaller health regions within Catalonia. This mix of central oversight with a degree of local control facilitated the development of programmes that met local needs while ultimately guaranteeing a common standard of care for all citizens, taking advantage of both bottom up and top down management styles.

Amongst countries with no programmes, Greece, Poland, and Portugal all described strong central decision making with little room for local development of policies and procedures. In these countries, there is a dependence on central authorities to establish policy, with a vertical or top-down approach to implementation. As an example, the Ministry of Health in Poland is in the process of developing a national medicines management programme via a multidisciplinary task force which will address polypharmacy. The results of this are expected by the end of 2016. Italy is the only country without a polypharmacy programme where delivery of care is devolved on a regional level. This may be related to the severe economic stress the country has been under since 2008. Local regions are making strides to integrate care, so it is possible that polypharmacy management will emerge within these efforts.

Effect of workforce capacity on programme development

Related to the structure of a health system is the workforce capacity within that system. Capacity includes both the distribution of different health care providers but also the qualifications and training of those providers (for more on education and training see section 4.4). Within the SIMPATHY consortium there were a relatively similar number of pharmacists per 1000 inhabitants (median 0.8,
range 0.6—1.1). This is important because the polypharmacy management programmes in both Scotland and Northern Ireland are based on using advanced level pharmacists, even though the number of pharmacists in these countries (0.8 per 1000) is not significantly different than other SIMPATHY countries. One way Scotland has been able to achieve this is by expanding the number of pharmacy technicians.

**Creating the roadmap—planning for change**

Another often overlooked aspect of adopting new clinical practices is the need to have a change management programme in place. The complexity of addressing an issue like polypharmacy, which requires change at the individual, organisational and system level, requires a clear plan of action to maximise the possibility of long-term success. In Northern Ireland, Scotland, and Sweden there was evidence of deliberate change management strategies related to polypharmacy and medicines management. In contrast, there was no clearly articulated change management strategy outlined in Catalonia or German, although elements of change management strategies could be identified. Another early step in Kotter’s process is creating a sharing a strategic vision. The strategic vision helps steer the effort both at the managerial and clinician levels. Within the case studies there were varying degrees of clarity of the vision both between cases and sometimes within them.

**Employing clear change management strategies**

Scotland had the most detailed change management plan in place, drawing on the work of both Kotter and Simons to develop their plan for scaling up polypharmacy programmes initiated by local health boards. This planning provided the framework for the roll out of the national polypharmacy guidance and continues to guide the polypharmacy programme in Scotland.

Although not directly related to polypharmacy, there are multiple initiatives in Northern Ireland that utilise a systematic approach to changing medicines management. The Health and Social Care Research and Development Fund has a strong focus on dissemination and implementation, while the Medicines Optimisation Quality Framework includes strategies to systematically promote innovation. The specific programme highlighted in the Northern Ireland case study describes “an overall project management approach to coordinate the organisation, direction and implementation of the intervention.”

In Sweden the initiatives that led to the national polypharmacy legislation had a clear focus on implementing change. As part of a programme to improve the quality of care for the elderly (the Be-Life programme), support was provided to municipalities to develop a long-term systematic change management process, and part of the funding for this programme was also allocated to leadership and management support. The inclusion of a change management approach was noted as a positive contribution of this project.

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8 Euros tat. Healthcare personnel statistics - dentists, pharmacists and physiotherapists
A recognised need for planning

Amongst the countries with no programmes or policies identified, there was an articulated need for this type of planning and communication of new initiatives. According to a pharmacist in Greece, “we need a step by step approach” to the implementation of practice guidelines. In both Italy and Portugal there was not a call for a specific implementation plan, but key informants identified multiple components of Kotter’s steps for change management that would be useful in implementing a new polypharmacy management programme including the need to create a stronger sense of urgency amongst policy makers (as previously described), the need for a small, guiding coalition, the types of barriers that would need to be removed to implement a programme, and strategies to create a sustainable model such as new funding models. Each of these is described in further detail in upcoming sections.

A strong strategic vision often, but not always, guided existing programmes

Within existing programmes, a strategic vision was typically articulated both in policy documents and by key informants. Sometimes this was a broad vision and communicated to a variety of stakeholders. Examples of countries where this happened were Northern Ireland, Sweden, and Scotland. Although in Sweden it was noted that the specific vision of how to improve medicines use in the elderly was not always shared by physicians responsible for implementing the polypharmacy legislation. In Germany, the vision was clear and well communicated amongst the pharmacy community, but there was limited dissemination of the vision to patients, physicians, and policy makers and concern that physicians would not accept the vision. This sentiment is captured by a German pharmacist, “[Competing] interests of pharmacists and doctors wear each other down and now I have become concerned that the [polypharmacy management programme] might be worn down.”

In Catalonia there was a clear distinction between the vision of the primary care model and the vision within the institutional model. Within the institutional model there was a clearly articulated vision shared equally by the hospital CEO, department managers, and clinicians that the programme was about improving the global quality a life for patients as described by a hospital CEO, “we have a model that from the beginning has been a very global vision, very patient centred.” In contrast, the vision for the primary care based polypharmacy management programme which, focused on patient safety, did not seem to translate from the managers of the Catalan Health System to practicing clinicians, and one pharmacist questioned if management truly bought into their own vision saying, “I also think that higher ups do not believe [in their vision].”

Developing a vision for future programmes

Countries without programmes had elements of a strategic vision in place, but as would be expected, did not have a clear or comprehensive vision of a polypharmacy programme articulated. Discussions around vision often focused on what a programme should look like—where it should be located (primary care, community pharmacy, or geriatric specialist), if and how a multidisciplinary team should be involved, or the need for guidelines and procedures to standardise implementation—and not on the larger vision for the programme. Key informants in Portugal had the sense that the programme would need to be centred on the patient, as expressed by one physician: “We’d only
achieve better outcomes, with greater quality and safety, if we keep the patient at the centre of the system.” A similar sentiment was expressed by key informants in Italy who suggested that a “global approach” to the patient was needed to manage polypharmacy, and noted that the Comprehensive Geriatric Assessment is an evidence-based approach to improving the quality of prescribing.

**Consolidating support**

Obtaining support at multiple levels, from practicing clinicians to health system administrators and policy makers, is another key step in the development of a new programme. Kotter describes the need to form a guiding coalition from within the organisation that will help “launch, guide, and – most importantly—sustain change.” An additional type of support needed for a new complex health programme is political support. Although programmes may begin as small pilots with limited political support, to ultimately gain traction and be scaled at a regional or national level, it is necessary to secure this type of backing. Political support may come in the form of government sponsored policies addressing polypharmacy management, legislation related to polypharmacy, or both. Almost all existing programmes utilised some form of guiding coalition in their development, but there was significant variation in the composition and formality of these coalitions. In terms of political support, this most often came in the form of government sponsored policies, although some legislation was also identified that directly or indirectly supported polypharmacy management.

**Broad based guiding coalitions with leadership at multiple levels**

The presence of guiding coalitions was noted in almost all countries that had programmes, and in those without programmes their future importance was noted. However, the composition of those coalitions varied considerably between cases. The German community pharmacy programme was part of a larger national initiative that began in a different state, so there was a sense of a guiding coalition within the pharmacy community. The coalition was limited to pharmacists with no involvement of other important players such as physicians or insurers. Northern Ireland, Scotland and Sweden, all described involving a wide range of stakeholders early in the process. Key informants from Northern Ireland and Scotland both mentioned the importance of having patients involved as described by a Northern Irish policy maker they would “go out into the intermediate care settings and the care home settings and talk to patients about their experiences of a service.” Within the Catalan institutional model there were multiple levels of guiding coalitions, including formal organisational alliances, alliances between departments, and a team of clinical leaders. The idea that there needs to be leadership at the management and clinical level was something that was also emphasised by Scottish key informants. According to a Scottish senior manager, “it [the polypharmacy programme] wasn’t imposed on anybody...the clinicians led it.” The one programme where a guiding was not clearly identified was the Catalan primary care model. At the management or practitioner level, there was a sense of individuals working alone and following instructions sent by either their supervisors.
Countries without programmes were very clear that any organising group should be multidisciplinary, including not just health care providers but others such as patients or patient representatives. Italian key informants noted the need to include those with information and communication technology expertise and statisticians who could facilitate evaluation. Both the Greek and Portuguese participants made similar suggestions to an initial planning group limited in size small and of highly motivated people.

**Legislation supporting polypharmacy management**

Sweden and Catalonia were the two countries where legislation specific to polypharmacy was identified. In Sweden all patients older than 75 years of age with five or more prescriptions are required by law to receive a medication review. Spanish law includes polypharmacy management as a mandated service for patients with multiple chronic conditions and for older patients, although implementation of this requirement depends on regional health systems. Although not specific to polypharmacy, in 2012 the pharmacists’ work regulation in Germany was modified to allow pharmacists to undertake medication management. This change in legislation spurred the creation of the existing programme which addresses polypharmacy. Additionally, Germany has legislation creating future e-health card, which will ultimately be appropriate for checking medicines data and after October 2016 all insured people who take three or more prescribed medicines will have the legal right to a written medication plan in from their doctors.

**Polypharmacy policies can support programme development**

Policies are more flexible than legislation, and can provide an important way for promoting change. Sweden, Scotland, and Catalonia all had policies specific to polypharmacy. In Sweden, in addition to their national legislation they also have national quality prescribing indicators, national quality indicators for care of the elderly, and a national medication strategy that all guide activities around polypharmacy management. Scotland, as previously mentioned, has published national polypharmacy guidance that is in its second edition. In addition to this guidance, Scotland also had a series of other policies, including The Right Medicine and Prescription for Excellence, which both informed the current polypharmacy programme. The Catalan Health Plan outlines health priorities in Catalonia, and addresses polypharmacy management within the larger initiative to improve care of patients with chronic conditions.

**Programmes developing without polypharmacy policies**

Both Northern Ireland and Germany were able to develop and implement programmes in the absence of specific polypharmacy policies. In the case of Northern Ireland, there are a number of strategic documents guiding pharmacy policy, most importantly their Medicines Optimisation Quality Framework. The Regional Strategy for Health and Well-being also laid the foundation for the consultant pharmacist model by highlighting the need for integrated services to reduce hospitalisations and maintain care closer to home. From a policy perspective, Germany also had multiple documents providing indirect support to the development of the community pharmacy programme. The most important of these is the Action Plan for Medication Safety published every two years starting in 2008. Amongst other calls to action in these reports is the call for increased interprofessional communication and a stronger role for pharmacists.

**Existing policies could support future programmes**

By definition countries without programmes also have no policies related to polypharmacy, but this does not mean that there are not existing policies within these countries that could not be leveraged
to support a future polypharmacy initiative. For example, Portugal has national disease specific
guidance and a national formulary that does not specifically address polypharmacy but could provide
a potential framework for developing future guidelines. In Italy there is a movement to create more
integrated systems of care which is an ideal place to house a polypharmacy management initiative.
No such policies were identified in Greece where practitioners are left to follow disease specific
guidelines, potentially increasing the odds of inappropriate polypharmacy.

In addition to policies and legislation, government sponsored accreditation bodies can also play an
important role. In Poland accreditation standards for hospitals state that a pharmacotherapy team
must be present in hospitals and must monitor the “frequency of polypharmacy cases.” If enforced
and monitored, this type of accreditation standard could force the creation of policies and practices
to address inappropriate polypharmacy.

**Securing Financial Support**

Although appropriate management of polypharmacy can save resources in the long term, as with the
adoption of any new innovative practice or technology, there is an initial investment required. These
include the costs required to develop and evaluate the new initiative as well investments in initial
and ongoing training. Countries with the most developed programmes, Scotland, Sweden, and
Northern Ireland, all had initial upfront investments in their programmes and generated further
economic data supporting the new initiative. Both Scotland and Northern Ireland developed business
cases for their programmes and invested resources in training professionals and in analysing data
generated by pilots to create the case for scaling up. In Sweden support was provided by the
government and professional bodies for short term demonstration projects and this money was used
to demonstrate the clinical and economic impact of the programme, although a formal business case
was not made. It is important to note that in all three of these cases there were specific government
funds lending support: Northern Ireland and Sweden were able to take advantage of funding
dedicated to supporting the development of innovative demonstration projects and government
supported post-graduate training programmes for health professionals in Northern Ireland and
Scotland both directly and indirectly supported their initiatives.

Both Germany and Catalonia had significantly less financial support for their programmes. In the case
of Germany, support for training of participating pharmacists has come from the sponsoring
professional organisation and no government support has been provided. In Catalonia, the
government did invest in training physicians to conduct medication reviews in the primary care
setting, but this was a short term initiative and there is no ongoing support. Within the hospital model
in Catalonia new resources were used to pay for additional pharmacy staff, but this was a local
decision made within the context of the global hospital budget and not part of a broader government
supported initiative. Evaluation of the Catalan hospital model has occurred primarily through PhD
studies.
### Table 3 How programmes developed: factors that facilitate or hinder development

<table>
<thead>
<tr>
<th>Countries with Institutionally or Governmentally Supported Programmes</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Catalonia (Spain)** | Primary care: Data on polypharmacy and chronic disease generated urgency; developed in regional health system model; no clear change management plan; legislation and policies supporting polypharmacy management (both models); no additional financial support  
Institutional: No data prior to implementation; culture open to innovation and shared decision making; developed in regional health system model; no explicit change management plan but evidence of planning for change; financial support for new positions and PhD studies |
| **Germany** | No national or regional data on polypharmacy available, urgency generated around medicines safety; programme fit with professional cultural values, legislation permitting pharmacy-physician demonstration projects; developed within regional chambers of pharmacy; no change management plan; no external funding |
| **Northern Ireland (UK)** | Data on medicines use and hospitalisations to generate urgency; culture open to innovation and shared decision making, shared independent prescribing; developed within regional health boards; use of project management techniques and care mapping to implement change; multiple policies outlining strategic medicines management plan, not specific to polypharmacy; innovation grants provide start-up funding |
| **Scotland (UK)** | Data on polypharmacy, medicines associated hospitalisations fuelled urgency, and education campaign to generate urgency; culture open to innovation and shared decision making, shared independent prescribing; national policy originated in regional health boards; explicit change management strategy; multiple policies outlining strategic medicines management plan, specific guidance on polypharmacy; government resources invested in demonstrating clinical and financial value |
| **Sweden** | National indicators for good pharmacotherapy in the elderly, patient cases and media attention to generate urgency; national legislation stemmed from regional activities; change management strategy as part of programme development; specific legislation on polypharmacy, multiple supporting policies; financial support for demonstration projects |

<table>
<thead>
<tr>
<th>Countries with no Identified Programmes</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td><strong>Greece</strong></td>
<td>Awareness but no yet urgency, monitoring of electronic prescriptions provides baseline data on numbers but not appropriateness; culture not open to multidisciplinary teams and shared decision making; strong central decision making; identifies clear need for change management strategy</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
<td>Awareness and some urgency, multiple national studies on polypharmacy but no national indicators; identify need for more data on implications for health system to convince policy makers; physicians not accustomed to shared decision making; regional control of health delivery could promote local innovation; movement to promote integrated care could be option for addressing polypharmacy</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
<td>Awareness but not yet urgency; no national data on polypharmacy or prescription trends; strong central decision making; multidisciplinary working group supported by Ministry of Health developing medicines management plan, hospital accreditation bodies require polypharmacy management</td>
</tr>
<tr>
<td><strong>Portugal</strong></td>
<td>Awareness but no urgency; identified need for country specific data on prevalence and consequences to convince policy makers; physicians not accustomed to shared decision making; strong central decision making by Ministry of Health; disease specific guidelines and national formulary could be used as framework for addressing polypharmacy</td>
</tr>
</tbody>
</table>
4.4 How were programmes implemented?

The question of how to implement a new polypharmacy management programme was a significant point in many of the case studies. Although there might be consensus on the importance of the issue and even policies and funding mechanisms to support development, implementation is a completely different endeavour. In the words of a Catalan hospital CEO, “it is clear [that we need a programme to manage polypharmacy]; the issue is in the how, how will we do this?” This section describes the facilitators and barriers to successful implementation including the role of education, reallocation of resources, role definition in a new practice, and the role of monitoring and evaluation. We also briefly touch on the final scaling up process. Results are summarised in the box on this page, with country specific information in Table 4.

Workforce Training and Continuing Professional Development

The need for education also emerged in both case studies with programmes and those without. Workforce training touches on a wide range of issues related to both the development and implementation of a polypharmacy management programme. Regarding programme development, education can contribute to a sense of urgency and can create a common understanding of the problem. Education also helps shape professional culture. Within the SIMPATHY case studies, training, or re-training, was a key part of implementation activities. In fact, when a hospital pharmacist in Catalonia was asked about key pieces of advice he’d give to someone starting a programme the first point he mentioned was training. Given the important role of training in implementation, all topics related to education are presented here.

Key Points

Education is critical for the successful implementation of a polypharmacy programme, but university training is often lacking.

Postgraduate training opportunities and requirements vary widely across Europe, influencing the type of programme that can be implemented.

In many countries skills around interprofessional communication are lacking.

A robust information and communication technology (ICT) system was a major facilitator to implementing a polypharmacy management programme. Shared patient records and population level indicators were especially important.

Countries without strong ICT systems cited this as a major barrier to implementation.

The addition of or reallocation of new resources is necessary for implementation.

Linking polypharmacy management with contracts can incentivise uptake.

Multidisciplinary teams are an integral part of polypharmacy management, but are challenging to implement.

Good polypharmacy management will require professional roles to shift, but this can cause tension between professionals.

Polypharmacy management cannot be added on top of existing work. Redesign of workflow is essential.

Both process and outcomes need to be measured, with a focus on timely data for both clinicians and policy makers.

Scaling at a large scale requires continued commitment and re-evaluation of each of these elements.
University training lays the foundations

The type of undergraduate and graduate training that providers receive significantly influences what types of services will be developed in a particular region. Although the European Commission (EC) sets the minimum standards for pharmacist training within the EU, there is significant variation in delivery between countries. For example, the UK, Germany, and Greece have all a traineeship period of 12 months versus the 6 months required by the EC, providing more opportunity for these graduates to achieve the required clinical skills prior to being licensed practice. Different countries have also introduced topics within the university curriculum that are specifically designed to support the polypharmacy management programmes. In Scotland, MSc programmes were established in the 1980’s to support the development and delivery of clinical pharmacy services in hospital. More recently polypharmacy management has been integrated into the curriculum of pharmacists, nurses, and physicians and into postgraduate clinical and prescribing programmes. The polypharmacy management initiatives in Sweden have also been supported by changes in pharmacy education that began there in the late 20th century. During this time new elective clinical pharmacy courses were introduced into the basic curriculum while pharmacists were integrated into internal medicine teams at the university hospital of Uppsala. In 2006 a master degree in clinical pharmacy, which was based on the Scottish clinical pharmacy model, was initiated. At the same time polypharmacy management was also being incorporated into physician training as part of the basic degree and during specialisation. The additional training in both professions combined with the new clinical services acted as key facilitators to the implementation of national polypharmacy management policies at regional level.

Training is insufficient in many countries

In contrast, a lack of training at the university level was specifically noted in Germany, Italy, and Portugal. According to an Italian physician, “medical education [at the university level] is not structured and adequate to address the issue of polypharmacy and comorbidity.” And in Portugal a hospital nurse noted, “training professionals with some concepts of pharmacology, pharmacovigilance, iatrogenic risk, prescribing cascade seems to be very relevant, because people are not aware.” In Germany there was an acknowledgement that university training is not sufficient for pharmacists (in spite of the 12 month traineeship), and specific concerns were raised about the lack of clinical skills amongst older practitioners.

Postgraduate education is essential but varies widely

In addition to university training, the availability of postgraduate level training also influences what programmes develop and how they are implemented. Each country determines their specific requirements for postgraduate training and continuing professional development, and significant variations were noted within the SIMPATHY case studies. For example, in Spain, post graduate training is established by the National Government, which includes requirements for residency training. Spanish hospital pharmacists are required to complete a four-year residency, although no post-graduate requirements are established for other pharmacy practice settings such as community or primary care. The UK has established mandatory continuing professional development requirements for practicing pharmacists and both Scotland and Northern Ireland have agencies (NHS Directives 2005/36/EC).
Education for Scotland and Northern Ireland Centre for Pharmacy Learning and Development) that provide support for these activities, which also support the medicines management programmes in these countries. Having these education structures in places was a key facilitator to the programme development and implementation.

The types of training available in a country often aligned with the types of programmes that were developed. The fact that one of the Catalan polypharmacy management programmes utilised hospital pharmacists makes sense, as this is where the most highly qualified pharmacists in Catalonia work. Within the UK, pharmacists have a long history of being integrated into multidisciplinary teams within hospitals, so the decision to employ pharmacists in all general practices and expand their role in intermediate care also makes sense, as it fits within existing practice models. In terms of Kotter’s principles of change management, education initiatives can be seen as a way to remove barriers to change, as they ensure that individuals within the system have the right tools to implement a new programme.

**Training is necessary but not sufficient**

Although university and postgraduate workforce training is a necessary component to develop an interdisciplinary polypharmacy management programme, it does not guarantee this type of practice will emerge. Italy, Greece, and Portugal all provide postgraduate training opportunities to specialise in hospital pharmacy; yet no formal programmes related to polypharmacy management emerged in any of these countries. And, as with the UK, both Greece and Germany have a 12 month traineeship period, although pharmacist participation in polypharmacy management is not as advanced in these two countries as it is in the UK. Similarly, Poland has mandatory clinical professional development requirements for practicing pharmacists, but unlike in the UK, this has not been channelled into support for advanced clinical services or polypharmacy management by pharmacists. Clearly, training opportunities are important for the implementation of a polypharmacy management programme, but training alone does not guarantee that a programme will develop. For training to support the development of a programme the skills taught must align with the abilities required in polypharmacy management.

**Programme specific education**

Training initiatives specific to the various polypharmacy programmes were also identified. The Northern Ireland consultant clinical pharmacist model is designed to provide additional mentoring and continuing professional development to pharmacists in intermediate care settings. In Scotland, in addition to the university and postgraduate training, joint workshops were conducted for pharmacists and physicians to encourage team building. The Catalan Health Department conducted workshops on medication reviews targeted at primary care physicians, but this was a short term initiative. The institutional based programme in Catalonia is dependent on individual practitioners and does not have any formal training procedures. Training for the German community pharmacy programme is overseen by the sponsoring organisation, the regional Chamber of Pharmacists. Training consists of a two-day workshop and a four-month practical phase overseen by tutors who are paid by the Chamber. This allows pharmacists to obtain a certificate to participate in the programme which is valid for 36 months.
More focus needed in interprofessional communication

It is important to note that across case studies a deficiency that was mentioned equally by those with and without programmes was the lack of interprofessional communication. Multiple case studies reported problems with communication between physicians and pharmacists or a lack of skills required to work in multidisciplinary teams. This could be due to either insufficient training in this area or an oversight to address these skills completely. The Polish focus group specifically recommended including communication courses in both the medical and pharmacy curriculum to promote better interprofessional communication. In addition to training in clinical skills and teamwork, training was also cited by some as a way to get buy-in to a programme. This was the case in the Catalan primary care model, where training served the dual purpose of educating physicians on the need to address polypharmacy and on the skills to provide the service.

The role of technology in implementation

Health information and communication technology (ICT) is critical for programme monitoring and evaluation at the population and individual level. Some of the most important ICT tools for this are shared electronic medical, prescribing, and dispensing records that provide the necessary support for patient level implementation but that also provide data that can be aggregated at the population level. Although these systems may not be absolutely essential for an initial pilot programme, the ultimate scale up process and long term management of a polypharmacy and adherence programme will require a strong health ICT system.

A wide range of ICT systems exist

Within the SIMPATHY consortium a broad spectrum of local and national health ICT systems were identified, ranging from extremely limited to highly integrated electronic patient records. The most advanced ICT systems were utilising the primary patient data for population level monitoring and evaluation of the programme. In some countries, such as Catalonia, the ICT system was mention by multiple key informants as a significant facilitator to implementing a new programme. In countries where there were more limited systems, such as Germany, Poland, and Portugal, the lack of ICT systems was seen as a significant barrier.

Catalonia, Scotland, Sweden, and to a certain extent Northern Ireland had systems in place to capture baseline data and monitor implementation and outcomes. Catalonia and Scotland both used specific indicators related to polypharmacy and good prescribing, whereas in Sweden they primary used the national indicators for good pharmacotherapy for programme monitoring. Northern Ireland has patient specific data available through the Northern Ireland Electronic Care Record that includes information such as lab results and clinic notes, but no specific indicators related to polypharmacy or adherence are tracked either at a patient or population level.

“[We need to] create more efficacious mechanisms of communication between hospital teams and primary care teams, because this is usually a mess.”

Portuguese nurse
**ICT supporting patient management**

In addition to population level indicators, ICT to manage patient records are also critical elements of implementing and scaling a programme. Catalonia has an extensive electronic patient record system that includes both medical records and prescribing and dispensing data. This facilitates care coordination as patients move from hospital to primary care, and also with monitoring and evaluation of the programme. Within the electronic medical record, patients in need of a medication review are automatically flagged based on predefined criteria. According to one primary care manager in Catalonia, “one advantage of our system is that it is completely computerised, you can register everything, and one thing we register is...if the patient’s [medicines] have been revised.” Similarly, most records in Sweden are electronic, but linkages between institutions depend on the specific setting and county. A national register of dispensed prescription drugs is also available to physicians, nurses, and pharmacists. Records in Scotland are electronic but only available with a given general practitioner’s office. This was cited as a potential problem by a Scottish pharmacist and policymaker who said, “from a patient safety perspective, you want all the interventions and all the information about the patient to be in one place” and “that doesn’t always happen if a pharmacist reviews a patient’s medications in a different location.” Records are also not shared between hospital and primary care.

**Better ICT systems are “urgently” needed to manage polypharmacy**

Greece, Italy, Poland, Portugal do not have currently have indicators to monitor polypharmacy on a national level, although some existing systems could be leveraged to do this. Greece has nearly universal electronic prescribing and can detect the presence of polypharmacy, but data generated by this system are limited to quantifying the scope of the issue without any assessment of prescribing appropriateness. Italy and Poland both have national databases of dispensed medications that could provide valuable information related to polypharmacy. None of these countries have shared electronic medical records that support managing a patient’s medicines across care settings. In Poland this was cited as a “main barrier” to implementing a polypharmacy management programme with an “urgent need” to develop these tools. One Portuguese physician cited the need to create “a data warehouse where data could be easily retrieved” whereas a nurse called for “more efficacious mechanisms of communication between hospital teams and primary care teams, because this is usually a mess.” Efforts are underway in Italy to develop linked medical records and in Poland they are working on creating an electronic depository of patient information.

The situation in Germany is complex, with insurers being the primary keepers of health information data and the only ones capable of linking patient-specific prescribing information with other health data. As of October 2016 patients on three different medications will have the right to a standard medication records which will include a diagnosis for each medication, but the patient will be the holder of this information not the health system and there is currently no way for health professionals to inform themselves of the current medication use of patients. Within the context of the community pharmacy programme, the lack of a strong ICT system hindered implementation. To document their activities, pharmacists were working with a system separate from the system for dispensing, meaning there was a significant amount of duplicate work. Pharmacists were also not supported by any decision support or drug interaction software, which made the time to complete a medication review very long.
**Data on adherence are virtually non-existent**

Interestingly, there was no mentioned of indicators related to adherence. In fact, some key informants in Catalonia mentioned the difficulty in measuring adherence as one reason it was not currently being systematically measured, but that this was a direction that they needed to go. “Speaking of adherence, from the perspective of CatSalut we have not addressed it in terms of developing indicators or in terms of measuring it...the problem with adherence is measuring it.”

**Reallocating of resources and payment models**

Most new initiatives will require resources, which, in a resources scarce environment, usually mean reallocating existing budgets or staff time. Within the context of NPT, reallocation of resources falls under the construct of collective action, or the work that an organisation does to enact a new set of activities. The presence or absence of resource reallocation was a significant factor noted by key informants as to whether they saw new practices becoming embedded within normal daily activities.

**Creating new positions**

One way to reallocate resources is to create new positions, either by bringing additional staff on or redefining the work of existing staff. In Sweden these decisions depend on the county—each county is free to allocate money within their budgets to meet the legal requirement of performing medication reviews. Some have done this by hiring additional clinical pharmacists in hospital and primary care. In the Northern Ireland consultant pharmacist model as well as in the Scottish general practice and Catalan institutional models, new permanent pharmacy positions have been created to provide long term support for these programmes. Significantly in Greece, a country without a programme, multiple key informants identified hiring additional personnel as strategies for implementing a new programme.

**Contracts as a tool to promote change**

Contracts with providers are a common and important way to provide ongoing financial support and legitimacy to a new initiative, and are often seen as a tool for standardising service delivery. Scotland and Catalonia have introduced medication reviews into contracts with primary care providers, with a pay for performance model adopted in Catalonia. Pay for performance is also employed in Sweden, where both the number and quality of medication reviews are reviewed as part of hospital contracts with country health authorities. Contracts can also sometimes lead to unintended consequences, and if overly prescriptive can create an environment that stifles innovation. This issue arose in the Catalan case, where the requirements of the contract were seen as too prescriptive and necessarily reflective of daily practice. This was also the case in Scotland, where it was acknowledged that previous contracts focusing on adherence to disease specific treatment guidelines might have been exacerbating the problem of polypharmacy.
**Lack of financial incentives limits implementation**

Importantly, the German community pharmacist model was not able to arrive at a contractual arrangement with insurers and participating patients were required to pay out of pocket, significantly limiting pharmacist’s ability to fully implement or scale up the programme. Although they do not yet have programmes, both Italy and Portugal highlighted the importance of remuneration for services as facilitators to implementation.

**Creating teams and allocating work**

Consistent across all cases, both those with and without programmes, was the agreement that multidisciplinary teams should be employed to address the polypharmacy management. The need to clearly define who within these teams is responsible for which tasks was identified as a critical step in their implementation. This can involve a clear allocation of responsibilities, but also a redefinition of professional roles, a process that was often cited as creating tension between different groups of professionals.

As with reallocation of resources, the question of who does the work also falls within the NPT construct of collective action. There is also an element of cognitive participation, or the work that people do to build a community around a new clinical practice. In this case, the reallocation of tasks from one professional to another requires a belief amongst all professionals that this new structure is correct and that the right professionals are doing the right work. As evidenced by the case study results, this was not always the case.

**Teamwork is challenging**

Even as participants acknowledged the importance of multidisciplinary teams and collaboration between different providers, there was also recognition of the difficulty in forming these relationships. Key informants from both Italy and Portugal expressed the need to balance the new model of teamwork with the existing hierarchical structures. According to an Italian physician, “Team work is not easy: we need to find a trade-off between hierarchy and team work.” And one Portuguese pharmacist emphasized the importance of personal relationships in forming multidisciplinary teams: “That why…it depends upon the relationship...the best teams depends on the relationships.” In some cases, such as Catalonia, Northern Ireland, and Scotland, there was no particular mention of the challenges of teamwork. Multiple key informants in the Catalan institutional model attributed the success of their multidisciplinary to the “culture of geriatrics,” where there is a long tradition of working collaboratively with other healthcare providers. They did however acknowledge the difficulty in translating their model to other non-geriatric services within the hospital (such as cardiology), and hypothesised that these providers might be less used to working in multidisciplinary teams with shared decision making. In Scotland, different models have emerged with the multidisciplinary teams with pharmacists taking the lead that include the GP and geriatrician.

**Changing professional roles can create tension**

Adding to the complexity of creating multidisciplinary teams is the tension between different professional groups as the traditional roles shift. This was especially clear in the cases of both Germany and Sweden. In Sweden, some physicians felt that “the focus was too much on pharmacists”
when the medication review legislation was being enacted and one pharmacist noted that “there are also still some voices against the performance of [medication] reviews by pharmacists.” German pharmacists expressed multiple concerns about the lack of coordination and cooperation with physicians. One community pharmacist said that there was initially “hope that more cooperation on the doctor-pharmacist level” but this did not play out in practice. There was also a sense that the pharmacist’s new role in medicines management was threatening to physicians who might view them as trying to “usurp” the physician’s role, and concern for patients who might feel that they did not want to “stab their doctor in the back” by going to a pharmacist for medicines management.

This conflict in roles did not emerge in all case studies. Within the Catalan institutional model, there was clear agreement across multiple key informants that the role of the pharmacist was important in multidisciplinary teams. According to the director of the geriatrics unit, “the aim was to find a way to design the patient’s prescription in a shared way between physicians and pharmacists.” He went on to say that to achieve this goal they needed to “utilise pharmacy resources differently.” A lead pharmacist on the Northern Ireland programme also described the importance of involving the multidisciplinary team early in the process and the importance of “developing the roles of hospital pharmacy staff” within those teams. Within Scotland there was some initial scepticism expressed by physicians wondering if pharmacists were “able to do the reviews as well as a general practitioner” but after seeing the evidence that the programme worked, physicians were very receptive, even asking for pharmacists in their practices. Sweden, in spite of the tensions mentioned by some, also had numerous examples of clinical pharmacists being integrated successfully into care teams, especially in the hospital setting.

Workflow and daily practice

Another challenge of a new programme are the changes required in time management to integrate a new service. Again, this falls within the NPT construct of collective action. Within the case studies, there was a clear distinction between programmes that worked to embed practices within the existing work flow and those that looked at the new activities as an add-on to existing clinical duties.

Embedding the work in daily practice

Within both the Northern Irish programme and the Catalan institutional model, key informants described having a clearly defined and protected time devoted to the programme. In one Catalan hospital the pharmacist and physician met daily for half an hour to review patient drug therapy plans. In Northern Ireland, in addition to daily clinical activities the team had a monthly meeting where they would “bring along the cases and the patients they are seeing” to conduct case reviews. In Scotland there was a focus on ensuring that medication reviews were not a burden to physicians. As one physician policy maker stated, “they’re [general practitioners] very focused on their workload income ratio and if you get that wrong they’ll be very against it.” Strategies for accomplishing this included incorporating medication reviews into existing care planning activities which reduced the redundancy of the task. Utilising prescribing pharmacists was also important as they were able to take some of the work load off of physicians and not create a “pile of queries” for them to review.
Creating additional work doesn’t work

In situations where there was no reallocation of time, implementation was limited or inconsistent. In the Catalan primary care model, physicians were expected to add the medication reviews into their daily clinical practice, with no change in time allocation or the number of patients they were required to see. Primary care pharmacists did also not see any change in their responsibilities and were not able to help with the additional work. One primary care pharmacist summed it up this way, “if we want to do this [additional medication reviews], we will need to change the dynamic of how we work, if we need to do this but continue doing things the same, well, this will be difficult.” Similarly, in a Catalan hospital where the polypharmacy management programme has not yet been institutionalised, the pharmacist had no dedicated or protected and described providing medication review as often as she was able but not consistently.

The German community pharmacy model also suffered from the same challenge. Pharmacists were adding the medication reviews onto their existing workload with no additional staff to help. According to one pharmacist, “I have always done this [medication review] in my spare time,” and reflected that, “I have not integrated it correctly.” Pharmacy technicians were mentioned as a way to possibly address this challenge.

Monitoring and Evaluation

Monitoring and evaluation serve multiple purposes when implementing a new programme. Formative evaluation provides insight into how a programme is being implemented and can help identify if any corrective action is needed operationalise policies. Summative evaluation provides the evidence of the effect of the intervention, and is essential for demonstrating the benefits of a programme to both clinicians and policy makers. Additionally, both of these types of data can be leveraged to create and sustain momentum for a new programme. One of Kotter’s steps of the change management cycle is generating short terms wins. This helps keep those involve motivated and spurs others to participate and support the new initiative. As has been previously discussed, polypharmacy management initiatives are complex endeavours and evaluation was identified and an essential, yet difficult, part of implementation.

Monitoring implementation—are we doing what we say we’re doing?

Evidence of process evaluation was limited in most case studies. This was specifically mentioned in the case of Sweden, where individual counties are responsible for compliance with the legislation. One member of the National Board of Health and Welfare (Socialstyrelsen) noted that at a national level “we did not monitor the implementation and the performance of medication reviews...nobody [nationally] checks if these reviews are actually performed in a correct way.” Both Catalonia and Scotland utilised contracts as a way to monitor if medication evaluations have occurred, although concern was raised in both setting about the need to also monitor quality. According to one Scottish policy maker, some professional groups have raised
the issue that “it [a medicine review] has become a tick box exercise and they are questioning the quality of the reviews.” A policy maker in Catalonia expressed a similar concern stating measuring the quality of a review is a “big problem” that has not been solved.” She went on to state, “I have not seen any indicator that allows you to make a good assessment of whether a review of the patient’s medicines did or did not occur,” illustrating one of the many challenges in the monitoring and evaluation process.

To address the issue of quality, in Uppsala County, Sweden random chart reviews on patients who are document as having received a medication review are required as part of contractual agreements. The Northern Irish consultant pharmacy model uses the Eadon grading system and the Medication Appropriate Index to assess the significance and quality of documented clinical interventions. Interventions are assessed by both the person doing the intervention and a sample is evaluated by peers on a monthly basis.

**What is the impact of the programme?**

Deciding what to evaluate in a polypharmacy programme is a challenge that was noted by multiple key informants across case studies. What gets evaluated will depend on the setting, the programme objectives, and the data and resources available to conduct the evaluation. A wide range of indicators were used in each programme. Common themes included evaluating the impact on the quantity or quality of prescribed medicines, and control of chronic disease, and hospital readmission rates. A brief summary of these is presented in Table 4.

Although it was previously mentioned that economic data was not seen as the primary selling point to generate urgency around a new polypharmacy management programme, this data was essential in the overall evaluation of a programmes. Northern Ireland, Scotland, and Sweden all completed economic evaluations of their programmes and key informants in Scotland specifically highlighted the importance of these data in scaling up the programme. As described by a pharmacist senior manager, “The financial aspects are always going to be preeminent in a board’s mind because a health board has a legal obligation to break even.” The potential cost savings associated with the programme became one of the “carrots” to get policy maker buy in.

Countries without programmes were also clear on the need for evaluation, and were able to provide concrete suggestions on indicators that would be useful in a future programme. Portuguese key informants highlighted the need for both process and outcome indicators. These closely mirrored what is currently being evaluated and included items such as the number of medicines being used, the appropriateness of therapy, the volume of use for emergency and ambulatory care, and rehospitalisation rates. The importance of monitoring the long-term outcomes of a programme was also mentioned as well as the economic impact. The challenges of accomplishing this in the absence of existing data sources was noted by the Greek study team.
Table 4 Selected indicators used in some sites to monitor polypharmacy programme

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<thead>
<tr>
<th>Country</th>
<th>Example Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catalonia</td>
<td><strong>General Pharmacy Indicators</strong></td>
</tr>
<tr>
<td></td>
<td>- Number of prescriptions per user</td>
</tr>
<tr>
<td></td>
<td>- Average cost of prescription per patient</td>
</tr>
<tr>
<td></td>
<td><strong>Polypharmacy Management Specific Indicators</strong></td>
</tr>
<tr>
<td></td>
<td>- % of patients with polypharmacy&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Index of prescription quality&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td><strong>Pharmacy Cost Indicators</strong></td>
</tr>
<tr>
<td></td>
<td>- Cost per patient treated with ACEI or ARB</td>
</tr>
<tr>
<td></td>
<td>- Cost per patient treated with cholesterol lowering agents</td>
</tr>
<tr>
<td></td>
<td>- Cost per patient treated with antidepressants</td>
</tr>
<tr>
<td>Scotland</td>
<td><strong>Standard polypharmacy indicator</strong></td>
</tr>
<tr>
<td></td>
<td>- 10 or more BNF paragraphs dispensed in a 6 month period with at least one High Risk drug</td>
</tr>
<tr>
<td></td>
<td><strong>High risk prescribing indicators:</strong></td>
</tr>
<tr>
<td></td>
<td>- Older person (&gt;=75 years) prescribed an antipsychotic drug</td>
</tr>
<tr>
<td></td>
<td>- Older person (&gt;=65 years) currently taking an ACE inhibitor/Angiotensin Receptor Blocker and a diuretic, who is prescribed an NSAID (the ‘triple whammy’)</td>
</tr>
<tr>
<td></td>
<td>- Older person (&gt;=75 years) prescribed an NSAID without gastroprotection</td>
</tr>
<tr>
<td></td>
<td>- Older person (&gt;=65 years) currently taking either aspirin or clopidogrel who is prescribed an NSAID without gastroprotection</td>
</tr>
<tr>
<td></td>
<td>- Current anticoagulant user prescribed an NSAID without gastroprotection</td>
</tr>
<tr>
<td></td>
<td>- Current anticoagulant user prescribed aspirin or clopidogrel without gastroprotection</td>
</tr>
<tr>
<td>Sweden</td>
<td><strong>Drug specific indicators</strong>&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Drugs that should be avoided unless a specific reason exists: long-acting benzodiazepines, drugs with significant anticholinergic properties, tramadol.</td>
</tr>
<tr>
<td></td>
<td><strong>Diagnosis specific indicators</strong>&lt;sup&gt;d&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- COPD: Irrational use, oral β-2 receptor agonist; Hazardous use, non-selective β-receptor blocker.</td>
</tr>
</tbody>
</table>

ACEI: angiotensin converting enzyme inhibitor; ARB II: angiotensin II receptor antagonists; BNF: British National Formulary

<sup>a</sup>) defined as 18 or more different active ingredients dispensed in one month; <sup>b</sup>) composite index to evaluate overall prescription quality; <sup>c</sup>) Only one drug specific indicator is presented in this table. There are 9 principal drug specific indicators each one comprising 1-8 individual items (32 in total); <sup>d</sup>) Only one diagnosis specific indicator is presented as an example. There are 11 principal diagnostic specific indicators each one comprising 2-9 individual items on rational, irrational and hazardous drug treatment in common disorders in old age (63 items in total)
Timely data is essential

For data to be useful in the promotion of a programme, it needs to be produced in a timely manner. The balance between taking the time to conduct a thorough evaluation and generating short-term wins is challenging but important to address. According to a Portuguese physician, “From time to time, it would be important to know where we are about the implementation and where we are with our results. This would be crucial to keep motivating professionals.” In fact, a Catalan primary care pharmacist expressed frustration that outcomes data are only available annually and provide little motivation in implementing new clinical initiatives. Timely data is not only important for clinicians, but also for policy makers. For example in Scotland, the ability to generate positive data at the board level was critical for the eventual roll out at the national level. The capacity to achieve this will depend on the ICT system within a country or region and the indicators that are being monitored. According to a pharmacist leader from Northern Ireland, “before rolling out anything you need robust data collection.”

Anecdotal evidence can also be powerful

Although formal evaluation is important, the importance of informal evaluation also became evident. This could be patient anecdotes reinforcing the positive clinical effects, or feedback from colleagues. According to a Scottish pharmacist, “it’s people seeing it in practice” that generates buy-in, “it makes people feel better.” Positive feedback from nursing home staff in Northern Ireland also provided support for the programme. “The nursing homes loved it, loved us reviewing their charts [and] we got positive feedback from most of the GP’s (general practitioners),” said a pharmacist involved with the programme. And in Catalonia, it was noted that “the level of professional satisfaction was high” amongst those participating in the institutional model.

The challenges of scaling up and embedding new practices

Less evidence was seen around strategies to scale a polypharmacy or medicines management programme. Scotland was the only programme that described itself as being scaled at a national level, although they acknowledged the challenges of maintaining momentum around the programme. The continued incorporation of medicines reviews in the contract was identified as one way to ensure they are continued. The continued development of new supportive technology, such as a newly launched app based on the polypharmacy guidance, is another strategy they are employing the sustain moment and ensure the long term success of the programme.

In Sweden, although there is national legislation the conclusion of the case study was that the process of conducting medication reviews has not been fully scaled or implemented throughout the country. There are multiple reasons why the scaling process might have slowed down. One key informant cited new political leadership focusing on different issues: “Now that we have new politicians, and new problems within the country such as the high number of refugees, the focus in not on elderly care anymore.” After the national legislation mandating polypharmacy reviews was passed, there
was no emphasis on monitoring and evaluation and the guiding coalitions that had previously existed became inactive.

Northern Ireland’s programme was designed with the goal of creating a scalable and sustainable model, and they are currently in the process of translating this model to other health trusts. Key informants cited a number of strategies to sustain the momentum of the project including regular team meetings of regional leaders and participation in national and “UK wide groups” that address similar issues.

Like the Northern Irish programme, the goal of the Catalan institutional model is to create a scalable model, but they lack some critical data including an economic analysis and intermediate outcomes such as health service utilisation data. The German programme also faces barriers to scaling up. The most important of these include workflow, reimbursement issues, and established collaborations with physicians.

“Now that we have new politicians and new problems within the country, such as the high number of refugees, the focus is not on elderly care anymore.”

Swedish physician
### Table 5 How programmes are implemented: facilitators and barriers

<table>
<thead>
<tr>
<th>Countries with Institutionally or Governmentally Support Programmes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Catalonia</strong> (Spain)</td>
</tr>
<tr>
<td><em>Primary care model:</em> no post-graduate training requirements or government sponsored CPD; strong ICT system (both); contract and pay for performance incentives; limited evidence of multidisciplinary teamwork</td>
</tr>
<tr>
<td><em>Institutional model:</em> Required four year residency for hospital pharmacists; new positions funded; institutionalised multidisciplinary team</td>
</tr>
<tr>
<td><strong>Germany</strong></td>
</tr>
<tr>
<td>Training provided by professional associations, identified need for additional interprofessional communication skills; limited ICT; no payment from insurers; tension between pharmacy and physicians organisations;</td>
</tr>
<tr>
<td><strong>Northern Ireland (UK)</strong></td>
</tr>
<tr>
<td>Government supported CPD; strong ICT but no electronic prescribing; newly created positions; workflow and responsibilities clearly defined; ongoing efforts to scale up</td>
</tr>
<tr>
<td><strong>Scotland (UK)</strong></td>
</tr>
<tr>
<td>Government supported CPD; and electronic prescription and electronic patient records, but records not shared between institutions; efforts made to integrate reviews into workflow and create multidisciplinary teams; timely use of data to generate support; ongoing efforts to sustain momentum</td>
</tr>
<tr>
<td><strong>Sweden</strong></td>
</tr>
<tr>
<td>Advanced training available but not mandatory; strong ICT system; incentives determined locally, some use pay for performance others created new positions; new clinical pharmacy positions have been created; limited efforts to scale up</td>
</tr>
<tr>
<td><strong>Countries with no Identified Programmes</strong></td>
</tr>
<tr>
<td><strong>Greece</strong></td>
</tr>
<tr>
<td>Specialised hospital training; ICT limited to electronic prescribing; identified need for additional personnel</td>
</tr>
<tr>
<td><strong>Italy</strong></td>
</tr>
<tr>
<td>Identified need for additional training; limited ICT but under development; highlighted need to pay for services; recognition of challenge creating multidisciplinary teams</td>
</tr>
<tr>
<td><strong>Poland</strong></td>
</tr>
<tr>
<td>Government required CPD but impact unclear; limited ICT but under development;</td>
</tr>
<tr>
<td><strong>Portugal</strong></td>
</tr>
<tr>
<td>Identified need for additional training; ICT identified as barrier to implementation; highlighted need to pay for services; identified challenge in creating multidisciplinary teams</td>
</tr>
</tbody>
</table>

CPD: continuing professional development; ICT: information communication technology
5 | Lessons learned

An ageing population and its associated increase in chronic conditions are prompting health care systems to revise how care is provided, with an emphasis on social sustainability. Thus, options for better coordinated care that draws on patients’ needs as core principle of service design are emerging. In most cases, this emergence implies a profound revision of existing care processes: what tasks really need to be conducted; do they really add value?; which professionals are better suited to conduct them?; and, when and where should these tasks be carried out?

In spite of its undeniable relevance, it appears that polypharmacy has not received sufficient consideration in such in-depth reviews. Surprisingly, attention to polypharmacy seems to have come more often from other angles: governmental strategies emphasising safety and cost-containment or particular interests of professional associations seeking increased recognition for their members. The case studies collected in the current document depict a diverse European scenario. Rich and developed approaches to polypharmacy (Scotland, Northern Ireland and Sweden), coexist with less developed ones (Germany, Catalonia) and sites where timid steps are taking place (Greece, Italy, Poland) or others where importance or priority is still part of incipient discussions (Portugal).

Why programmes emerge and develop

The emergence of polypharmacy programmes has roots in common challenges being faced by most European health care systems, such a shrinking economy, aging population and an increase in the demand for healthcare services. Whereas a moderately stressed economy prompts health systems to search for more cost-efficient alternatives, a severe economic downturn will prioritise extreme cost-containment measures that can freeze any attempt towards innovation in polypharmacy management.

However, the level of pressure of these challenges and the influence of local factors (such as established health care priorities or interests of professional organisations) explain the scope and scale that these programmes achieve or fail to achieve.

One such factor that seems to positively count in a sustained development of a polypharmacy programme is its connection with wider health initiatives. Nation-wide strategies that promote improvement of health services with a focus on the care of older people seem to be a useful springboard for the emergence, development and scaling-up of polypharmacy programmes. This is the case, even if polypharmacy is not explicitly mentioned in such strategies.

On the other hand, nation-wide strategies with a narrower focus on safer use of medicines seem to be less capable to achieve a similar impact, although they can be a starting point if they succeed in mobilising a core group of stakeholders around them, such as a professional organisation that perceives a competitive advantage. They can also have an impact at a health system level if enacted by contracts that reward pay per performance. However, it seems that their long-term viability is related to the capacity to evolve towards scenarios that involve a wider range of stakeholders.

How programmes develop

Creating awareness

The perception of polypharmacy as a health problem precedes the development of any actions or policies. In this regard, a first and possibly necessary step seems to be the capacity of quantifying the problem and its impact at health system level. Such availability of data is related to the existing
capacity of information systems and to a certain organisational culture of using data to inform priorities and planning in health. On the contrary, lack of population data pointing at the size of the problem at local, regional or national levels seems to deter the translation into action. Scientific evidence available about the importance of addressing polypharmacy appears as insufficient to move to action unless corroborated in the local context. This seems to be true especially for policy makers and managers that demand convincing proof of the benefits of the new approach. The need of these economic grounds, though widely accepted, should not be seen as a justification to present them as a primary selling point to gain buy in from professionals.

Media campaigns have been helpful in creating awareness and generating urgency about polypharmacy. They are an interesting resource integrated in an overall strategy.

**Organisational culture**

Receptiveness to a new approach in polypharmacy management depends on the prevailing organisational culture, in other words, a predominant set of values, assumptions and believes that are shared by the group. The dominant culture influences the final understanding of polypharmacy, why it is a problem and why it is urgent, potentially creating a common view that different stakeholders share. Thus, countries that have programmes on polypharmacy seem to have a culture that is more open to innovation. On the contrary, those countries without programmes tend more often to point at cultural barriers that impede innovation.

Organisational culture is also in the origins of established work practices such as sense of teamwork. In countries without programmes, the potential for addressing polypharmacy was often allocated to the capacity of individual professional groups (doctors, pharmacists) and less in a teamwork approach. Interestingly, this is a situation that can be institutionalised by the laws that govern healthcare delivery (for instance, when defining the professional with authority over medicines management).

**Health systems structures**

Within health system structures the possibilities of developing new policies, reallocating resources or creating new practice models largely vary. Polypharmacy programmes develop and grow in those systems that allow certain amount of local control while still keeping some central authority. Initial experiences appear at local level or regional but with a capacity to scale it up. On the contrary, in countries with centralised systems the appearance of such programmes is less likely.

Interestingly, the workforce capacity (number of pharmacists) in the health system does not seem to determine the presence or absence of polypharmacy programmes.

**Planning for change**

Development and implementation of polypharmacy programmes are complex tasks impacting individuals, organisations and the health system as a whole. Intuitively this benefits from good planning. Countries with deliberated change management plans are more successful in incorporating polypharmacy programmes. The importance of this is also perceived in countries without programmes.

The formulation of an accompanying strategic vision reinforces the planning for change. But vision can also support the presence of components of change management, even if not articulated in an explicit change management plan. On the contrary, in countries without programmes, vision is usually inexistent.
Consolidating support

The development of a new programme requires gathering support from people (professionals and stakeholders impacted by the programme) and from government (policies and laws).

Gathering support from the group of people that are to lead on the development and deployment of the programme is universally acknowledged. The characteristics of the group (profiles of the members) may be different but the presence of a strong leadership at managerial and clinical level is required.

Country legislation specific to polypharmacy is not common but when available it is a main support for the development of the programmes. However, given their flexibility, policies that endorse polypharmacy can also be equally effective in promoting change since they usually provide a more practical approach. In countries with no programmes, policies related to polypharmacy are not available but other existing policies could be used to leverage support for future polypharmacy initiatives. Finally, it is interesting to mention the indirect effect that some accreditation standards can have in creating certain conditions favouring polypharmacy.

Upfront investment is required to develop appropriate management of polypharmacy to cover the costs of developing and evaluating the new initiative as well as the costs of initial and ongoing training. Programmes with less financial support tend to be more limited or less extendible.

How were programmes implemented?

Workforce training

Education, per se, does not guarantee the appearance of polypharmacy programmes. But clearly, the type of education available in a country aligns with the type of programmes that develop. And, vice-versa, new polypharmacy programmes can benefit from specific training initiatives.

Education has a positive influence in both the development and implementation of programmes: education facilitates the understanding of polypharmacy as problem, helps to create a sense of urgency and shapes a professional culture that is more responsive to it.

University training has significant variation among countries and only a few of them have introduced specific topics on polypharmacy in their curriculums. But even in this case, training is often complemented with additional preparation and clinical services practices. In countries where polypharmacy is not part of the curriculum, university training appears insufficient for pharmacists, especially as it relates to providing clinical services and direct patient care. Postgraduate training, notably in the form of residency or mandatory continuing professional development, is key facilitator in the development of programmes.

Apart from academic education, the need for training on specific skills to favour communication between physicians and pharmacist and multidisciplinary team work is often noted.

The role of technology in implementation

Although not absolutely essential for an initial pilot programme, scalability requires strong health information systems in place. In countries where such systems are available, they are seen as key facilitators for the implementation, permitting also the monitoring of the programme through primary patient data and recording of specific indicators. On the contrary, in countries without ICT systems these capacities do not exist and, therefore, constitute a barrier to programme development.
On a different note, health information systems do not collect any information of patient adherence at present. Indicators that could measure it seem to be poor developed if at all.

**Reallocation of resources and payment methods**

Developing and implementing a new polypharmacy programme requires an initial investment, notably in the form of workforce reallocation, but also to ensure specific funding with the purpose of driving the change. Amongst countries without programmes, the need for funding and remuneration for new services was particularly noted as an important facilitator for the development of future programmes.

Pharmacists played an important role in nearly all of the programmes studied, which often involved a redefinition of their role. There was a significant variation in how programmes approached this, both between and within countries. While there are countries or institutions that have created new permanent positions, others have used money available from the general health budget to prioritise this initiative in front of others. Employing different contractual agreements was also a way to engage pharmacists.

Contracts with providers, usually under the format of pay for performance, seem to be an option of choice to extent implementation of programmes. They give legitimacy to the programme but also provide a funding mechanism that favours consolidation into the healthcare system. Occasionally, though, they have been too prescriptive or have promoted a wrong focus (e.g. too centred in disease management). The latter can lead to unintended consequences and hamper the most innovative components of polypharmacy programmes.

**Creating teams and allocating work**

The creation of multidisciplinary teams is a must to address polypharmacy management. While there is a universal agreement with this statement, it is equally acknowledge that making it happen is not easy. First and foremost there is a need to define the profiles of professionals that are part of the team and their specific responsibilities. This process of redefining roles can generate tensions; some professional groups can perceive it as a form of professional intrusion whereas others can be discouraged by a slow pace of change.

Existing hierarchical structures and the creation of personal relationships are commonly reported barriers in countries without a programme. This is in contrast with the situation in countries with polypharmacy programmes where a culture of collaboration seems to prevail, notably among groups with greater orientation towards polypharmacy (e.g. “a culture of geriatrics”).

**Workflow and daily practice**

Integration of polypharmacy in the existing daily practice requires a reallocation of time. Perception that it is a new task that adds to an already too full work schedule will only result in limited or inconsistent implementation. On the contrary, if professional time is protected, then the deployment of the programme is facilitated.

**Monitoring and evaluation**

All countries, regardless whether they have or do not have a programme, agree with the importance of monitoring process and outcome indicators to evaluate polypharmacy programmes. There was also clear agreement of the difficulties that such evaluation presents.
Assessing the process of implementation was identified as an important but difficult task, partially due to the lack of reliable indicators or instruments. In this absence, contracts with providers have been utilised for such purpose, but their use was not widespread.

An apparent better solution has been found to check the quality of the medications reviews, with some countries applying random sample reviews and using existing indicators evaluating prescribing (e.g. Eadon grading system and the Medication Appropriate Index).

In countries with implemented programmes, evaluating the impact is very much influenced by the setting, the programme objectives, and the availability of data and resources to conduct the evaluation. A large variety of indicators exist grouped around some common themes, such as quantity or quality of prescribed medicines, control of chronic disease, and hospital readmission rates.

Also, in countries with programmes, economic evaluation has played a major role in the scaling up of the programmes, although these messages resonated less with clinicians. This demonstrates the key importance of demonstrating cost-savings to obtaining the buy in of policy makers, and the importance of having a range of programme evaluation indicators.

Finally, two characteristics more seem to be important with regard to the monitoring and evaluation of polypharmacy programmes. The first is the timeliness of evaluation data to support the development and deployment of the programme. The second is the undeniable importance attributed to anecdotal evidence in creating positive opinions towards the programme.

**The challenges of scaling up and embedding new practices**

The scale-up of polypharmacy programmes is difficult. Maintaining the momentum is problematic. Also, other or new health priorities may emerge thus diverting attention from polypharmacy. Some strategies to maintain momentum are to include the programme in the contract with providers or to facilitate the medication management activities conducted by pharmacists and physicians, for instance, developing new ICT solutions. Other solutions also pointed out are creating greater consciousness through team leaders and team work, expanding collaboration with other professionals and revising practice workflows.

**Creating change takes time**

One fact that became clear when examining programmes and how they were developed and implemented was the time that was needed. Creating the legal and political framework, a culture that is open to multidisciplinary teamwork, and workforce with the right skills to deliver the programme is not a small undertaking. For example, the programme in Scotland has its roots in changes in pharmacy education that began over thirty years ago, with multiple subsequent policy and legislative changes that all lent support to the current programme. This is not to say that implementing a polypharmacy programme will take 30 years, but policy makers, health system administrators, and practitioners should also set reasonable expectations for the pace and scale of change they expect to see.

**Conclusion**

Although countries across the SIMPATHY Consortium identified similar challenges facing their healthcare systems and largely agreed on the importance of addressing polypharmacy, approaches to addressing the issue varied greatly across the Consortium. The diversity of the programmes identified highlights the importance of creating local solutions to global problems. This point is
especially germane to countries without existing programmes as they move to create new ways of addressing polypharmacy. The experiences and insights from these case studies combined with the literature review and benchmarking survey will provide the necessary information for the development of future change management tools. These tools will help stimulate innovation and enable health systems across Europe to create polypharmacy management programmes that address their local needs, creating healthier populations and more sustainable health systems.
6 | Annexes

6.1 Summaries of the case study reports

6.1.1 Case Study Summary Scotland (UK)

Summary
Scotland currently has a well-developed polypharmacy review programme, which is now in its fourth year. National Polypharmacy Guidance (2012, 2nd edition 2015) was developed by a multidisciplinary group and has been adopted by all 14 health boards (100%) across Scotland, with each board having developed plans to identify priority patients with potentially inappropriate elements to their polypharmacy and to implement reviews for those patients at highest risk of harm. These reviews are now embedded in standard working practices across primary care supported by direct funding to General Practitioners (GP) to enable this work to be undertaken in a sustainable fashion. Employment of pharmacists working in primary care in collaboration with GPs and as independent prescribers to undertake polypharmacy reviews in line with the national strategy ‘Prescription for Excellence’ (Scottish Government, 2013) also supports sustainability, with ministerial funding for 140 pharmacists initially in 2015 to be expanded to a pharmacist for all GP practices in Scotland. Most recently the introduction of mobile app (ref) has sustained acceleration of implementation.

This case study, conducted as a desk review of available documents plus multiple interviews with key players in policy development followed by stakeholder focus group discussions, served to detail the development of what is considered to be a sustainable programme, focused on identifying the key factors which enabled the programme to be rolled out at national scale.

Characteristics of the case study

Name of the programme
NHS Scotland Polypharmacy Programme: Sustainable integrated multidisciplinary solutions @ scale

Locality/Region and country
The case study was conducted at national level covering the whole of Scotland. Scotland is divided geographically into 14 National Health Service (NHS) boards that serve the Scottish public (population 5.5 million).

Health care system overview
The health system in Scotland is funded centrally by Government through general taxation. NHS health boards in Scotland are allocated funding based on a formula that takes into account the relative deprivation of the population (ref SIMD) and demographics (including the proportion of elderly patients) within individual health board areas. The total budget of £10.1 billion includes a medicines budget of £1.4 billion of which over £1.1 billion is spent on drugs in primary care. The provision of healthcare in the NHS is free at the point of access. In the United Kingdom as a whole Total Health Expenditure is 8.5% of Gross Domestic Product (2013) with 12.3% of this pharmaceutical expenditure. NHS Health Boards work to deliver services in line with national strategy and policy.
through local delivery plans to meet performance targets. Pharmacists are employed by health boards to work collaboratively with GPs to deliver the national polypharmacy programme.

**Programme aims and objectives**

The aim of the programme was to address inappropriate polypharmacy and improve medicines adherence in Scotland by developing and providing guidance to all health boards on how to review treatments for patients with multiple long-term conditions, whilst minimising any harm and optimising benefits from the medication. Reduction in admissions to hospital was a key outcome measure and to reduce waste due to poor adherence in patients with multiple morbidities, not just the elderly. It was felt that by doing this adherence would also improve, particularly if issues relating to the prescribing of medications were addressed prior to tackling adherence. The expectation was that by addressing and improving the quality of prescribing there would be a reduction in overall health expenditure, not only on medicines, but also on related effects due to adverse reactions. The programme included economic analysis as a core feature to help build the financial case for implementing and sustaining the programme.

In summary, the programme had the following objectives:

- Close collaborative working between doctors (General Practitioners and Care of the Elderly Consultants) and pharmacists, both in development and delivery of the polypharmacy programme
- Ground-up approach to building a consensus on the need for, and the content of, the programme
- Early buy-in of primary care practitioners in terms of recognition of the usefulness of the project and willingness to deliver
- Early identification and engagement of opinion leaders to build urgency, support and enthusiasm
- Rapid recognition of the value of the programme by local health boards and Scottish Government leading to funding of the reviews by means of enhanced service and quality payments to primary care organisations

Early analysis of positive outcomes of the programme was fed back to policy makers.

**Institutions included in the case study**

In addition to Scottish Government, which represents NHS Scotland, the health boards that took part were:

- NHS Highland
- NHS Lothian
- NHS Glasgow & Clyde
- NHS Lanarkshire
- NHS Tayside

The rationale for inclusion for each of these boards was that NHS Highland, Tayside and Lothian were the innovators who influenced development of the national programme for which Glasgow & Clyde was an early adopter. NHS Glasgow & Clyde and Lothian are the largest boards in Scotland serving a population of 1.15 million and 870,000 respectively. NHS Lanarkshire followed in adopting and implementing the programme.
Managerial and policy highlights of the programme

Moving from importance to urgency

Since 2004, Scotland had experienced a 3% increase in medicines volume per 1,000 people registered with a general practice. Over recent years a series of reports had highlighted the mismatch between current advice on prescribing (largely based on research for single-disease conditions in younger adults) and the demographic shift in the population to an increasingly multimorbid and elderly population (ref Guthrie). In particular, the GP contract (Quality Outcomes Framework) had driven prescribing for single-disease states with the use of incentivised targets. This was a driver in the two years leading up to the development of the national polypharmacy resulting in a solid plan for urgent action. A series of meetings were held by opinion leaders in the field across a broad range of professional groups. It was seen as essential that the pioneering work done by NHS Highland and NHS Tayside was linked with pilot work in NHS Lothian where the polypharmacy reviews were incorporated into anticipatory care plans. This created the sense of urgency needed to encourage ground level buy in from prescribers at the same time as making the case for supporting change with key clinical policy makers securing funding from the Scottish Government. A guiding coalition was formed at these meetings and in the discussions that followed. Crucial to the move from theory to practice was the early engagement of clinicians and operational leaders given the need to ensure that the strategy was felt to be ‘owned’ by the country as a whole rather than imposed from one area to another.

Creating teams and strategic vision

The strategic vision for the programme came through refinement and expansion of work done by innovators and early adopters across the country. Policy leadership was essential at this stage to make the case to funding bodies to ensure the programme was practically deliverable. Throughout this stage, on-going work was done (largely through face-to-face meetings with key groups across the country) to ensure that, prior to the launch, as many opinion leaders in clinical and management roles felt they had on-going involvement and personal investment in the programme. This recruited the programme champions who were essential to driving change in local areas when the programme was launched nationally.

Creating practice models

The main and essential aid to successful implementation was the addition of a contractual requirement for GPs and recognising the potential role of pharmacist non-medical prescribers. This enabled the programme to be integrated into existing patient pathways while at the same time providing extra personnel and expertise to deliver it. That these aids were delivered was down to persistent work from senior policy makers interacting with Scottish Government to make the case for the economic and clinical necessity of the work. This in turn led to clear guidance to all the health boards that this work needed to be prioritised. The revised Polypharmacy Guidance (2015) built on the 2012 guidance and provided practitioners with a standardised structure for the medicines review process. Doctors and pharmacists in individual health boards agreed procedures for application of this process in daily practice.

Building sustainability

The need to make a case for sustainability was recognised from the outset of the programme. Reviews and any associated medication changes were documented. This was fed back to the government and health boards as evidence of short term gains of the programme with the
expectation that more would follow. There are approximately 12,000 polypharmacy reviews conducted every year in Scotland. On average one or two medicines are stopped at each polypharmacy review with commensurate cost savings on medicines. Of those patients identified to be at high risk of hospital admission, pilot work suggested a 40% reduction in hospital admissions following a polypharmacy review; reduction in high risk medication related issues is expected from roll out. Further research has supported this expectation with prescribing patterns in Scotland showing some national level change when compared with other UK home nations (fig. 1, 2; table 1, 2).

![Figure 1 Growth in prescribing in %terms](image.png)

**Table 1 Items dispensed**

<table>
<thead>
<tr>
<th>Year</th>
<th>Scotland</th>
<th>England</th>
<th>Wales</th>
<th>N Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>88,115,445</td>
<td>885,999,300</td>
<td>67,607,034</td>
<td>33,379,217</td>
</tr>
<tr>
<td>2010</td>
<td>90,641,133</td>
<td>926,657,600</td>
<td>69,825,718</td>
<td>35,366,062</td>
</tr>
<tr>
<td>2011</td>
<td>93,342,820</td>
<td>961,528,600</td>
<td>72,202,467</td>
<td>36,322,851</td>
</tr>
<tr>
<td>2012</td>
<td>96,137,339</td>
<td>1,000,502,400</td>
<td>74,639,489</td>
<td>37,841,141</td>
</tr>
<tr>
<td>2013</td>
<td>97,775,035</td>
<td>1,030,079,389</td>
<td>76,227,899</td>
<td>38,661,481</td>
</tr>
<tr>
<td>2014</td>
<td>100,051,574</td>
<td>1,064,573,755</td>
<td>78,538,624</td>
<td>39,685,577</td>
</tr>
</tbody>
</table>
Table 2 Growth from previous year

<table>
<thead>
<tr>
<th></th>
<th>Scotland</th>
<th>England</th>
<th>Wales</th>
<th>N Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>2.87%</td>
<td>4.59%</td>
<td>3.28%</td>
<td>5.95%</td>
</tr>
<tr>
<td>2011</td>
<td>2.98%</td>
<td>3.76%</td>
<td>3.40%</td>
<td>2.71%</td>
</tr>
<tr>
<td>2012</td>
<td>2.99%</td>
<td>4.05%</td>
<td>3.38%</td>
<td>4.18%</td>
</tr>
<tr>
<td>2013</td>
<td>1.70%</td>
<td>2.96%</td>
<td>2.13%</td>
<td>2.17%</td>
</tr>
<tr>
<td>2014</td>
<td>2.33%</td>
<td>3.35%</td>
<td>3.03%</td>
<td>2.65%</td>
</tr>
<tr>
<td>2010-2014</td>
<td>13.55%</td>
<td>20.16%</td>
<td>16.17%</td>
<td>18.89%</td>
</tr>
</tbody>
</table>

Annual volume increase has fallen in 2015 in Scotland to around 1%. Comparative data from the other UK nations is not yet available.

The data is also indicating a reduction in the number of people over the age of 75 with potentially inappropriate polypharmacy.

Figure 2 Trends in proportion of population dispensed 10+ BNF paragraphs + high risk drug in a six month period by age group. (Jul - Dec 2010 to Jul - Dec 2015)

Conclusions

Scotland continues on a journey towards improving care of multimorbid, frail adults. Clinical and management consensus has made it possible to implement a programme that better fits, and shows tangible benefits for, the target population.
The key steps that initiated and drove this change were:

- Building a clinical consensus that change was needed and what that change would look like.
- Consensus that this was a multidisciplinary effort but that patient involvement in the review was essential.
- Agreement of clinicians working across different disciplines and sectors on the principles of a review with evidence that would support the reviews.
- Risk stratification tools that would support clinicians to target the reviews on those patients identified as most at risk.
- Designing the programme such that economic and clinical impact was assessed from the outset, demonstrating long-term impact as well as immediate benefits to patients.
- Prescribing authority for non-medical prescribers, especially pharmacists, so that the design process enabled reviews to be actioned without creating additional workload for medical prescribers.
- Leadership from management and policy makers plus clinicians from the earliest stage and throughout.
- On-going work to keep both clinical and management opinion leaders involved and ‘bought in’ to the overall vision, with openness to review and refinement.
- On-going public involvement to evaluate the programme and development of tools for patients to feel empowered in making decisions regarding high risk medicines.
- Management of polypharmacy embedded into educational programmes of healthcare professionals at undergraduate and postgraduate levels.

It is important to note that the steps that helped initiate the change are continually revised and that the process is iterative and adaptive. This is considered to be essential to ensure sustainability and engagement from all stakeholders.
6.1.2 Case Study Summary Sweden

Summary
In 2012 the Swedish government introduced national legislation stating that all elderly patients using multiple medicines should receive medication reconciliation and, if necessary, a comprehensive medication review. This case study investigates how and why this legislation was developed and implemented on a national, regional and local level, with Uppsala County as the main example.

To answer these questions, factors for change were identified from a desk review and key informant interviews using the domains within the Kotter’s Change Model and the Normalisation Process Theory. Within all these domains both presence and absence of factors for change have been identified throughout this case study. Main facilitators were the presence of national health quality indicators and research studies showing the polypharmacy problem which led to political and public awareness, the engagement of key individuals and a broad collaboration at regional level, and investment in education and multi-disciplinary healthcare teams. Main barriers have been the lack of a common belief that medication review is an essential and effective intervention, the lack of a broadly shared view on how and by whom exactly these reviews should be performed, and the absence of a national strategy to fully implement and evaluate medication review legislation and policies.

New initiatives for further implementation should make use of change management strategies, taking into account all necessary steps for change. The identified existing barriers can act as a starting point for following measures in which the performance of medication reviews should be seen as an essential but not exclusive activity to improve the care for elderly with multi-morbidity.

Characteristics of the case study

Name of the programme
Development and implementation of medication review policies.

Locality/Region and country
In the first place, this case study takes a look at legislation and policy documents at national level in Sweden (almost 10 million inhabitants). Then it describes how medication reviews have been implemented at regional and local level within Uppsala County (about 330000 inhabitants).

Health care system overview
The aim of care for the elderly in Sweden is to guarantee equal access to healthcare and welfare. The responsibility for this care is divided between three levels of government. At national level, the government sets out policy aims and directives by means of legislation and economic steering measures. This is mainly done through the National Board of Health and Welfare (Socialstyrelsen). At regional level, the county councils or regions (21 in all) are responsible for the provision of healthcare. At local level, the municipalities (290) are legally obliged to meet the social service, nursing and housing needs of the elderly. County councils and municipalities have a very high degree of autonomy, with the right to levy taxes. Almost all care is financed by such taxes with the user only paying a fraction of the cost with an individual payment ceiling. All healthcare institutions use electronic patient records and electronic prescribing. Although some counties have shared electronic records between hospital and primary care, no national system currently exists.
Few hospitals, nursing homes and primary healthcare centres have employed clinical pharmacists. These pharmacists are mainly responsible for assuring that the patients’ medication lists are correct and performing medication reviews together with physicians and nurses. Although the number of clinical pharmacists is growing, most healthcare institutions in Sweden do not have clinical pharmacists employed at this moment. Therefore, many physicians need to perform medication reviews without such specialised resources.

**Programme aims and objectives**

The main objective of the particular national legislation is to increase and ensure the quality, safety and sustainability of pharmaceutical care in Sweden, with a main focus on polypharmacy in the elderly. The aim of a medication review itself is, according to Socialstyrelsen, to optimise the patient’s medication treatment and to minimise the incidence of drug-related problems.

**Institutions included in case study**

- Socialstyrelsen: a government agency under the Ministry of Health and Social Affairs, with a wide range of activities within the fields of social services, health and medical services.
- Swedish Association of Local Authorities and Regions (SALAR; SKL in Swedish): the national member organisation for municipalities, county councils and regions.
- Uppsala County Council: the main authority in charge of healthcare, dental care, public transportation and culture within Uppsala County. The county council defines local policies and guidelines and is responsible for enforcing national legislation at regional level.
- Uppsala University Hospital (UHU): this hospital acts as a county hospital, specialist hospital, training hospital and research hospital. In different wards of the hospital, clinical pharmacists work on a daily basis, mainly performing medication reviews.

**Managerial and policy highlights of the programme**

**Moving from importance to urgency**

The development and introduction of medication review activities originated from the availability of national quality indicators and research showing the increase of (inappropriate) medication use in the elderly, making drug use in the elderly one of the focus areas within healthcare. IT-developments, such as a national registry of dispensed prescription drugs, had made it possible to get access to these data. As the issue of inappropriate polypharmacy received national attention, the general public became aware as well.

**Creating teams and strategic vision**

The awareness of the problem was followed by the political will to fund activities to improve the management of polypharmacy in the elderly, such as the performance of medication reviews. Several national working groups were formed to develop legislation and guidance documents about such reviews. Although national guidance and legislation was developed, some regions within Sweden decided to promote prescribing in the elderly by other means than the performance of medication reviews. This might have resulted from a disbelief in the need for and effectiveness of such reviews and the availability of other options such as education on appropriate prescribing and medication safety. Next to that, there was no broadly shared view on how and by whom exactly these reviews should be performed. However, within Uppsala County, a broad range of key individuals within healthcare, the university and at governmental level became engaged, forming a strong collaboration to implement medication review activities at local level.
Creating practice models

In the late 1990’s, several Swedish pharmacists were trained as clinical pharmacists in the United Kingdom. After this training, these clinical pharmacists were integrated into hospital-based ward teams in several parts in Sweden, performing medication reviews on a daily basis. This was initially mainly by project based funding. After a few years, a clinical pharmacy programme was started at Uppsala University, which has been a major stimulating factor within the region. Next to that, the use of a pay-for-performance model based on the national quality indicators has accelerated the introduction of reviews locally in Uppsala.

From a national perspective and within other regions several barriers have existed. First of all, there seems to be a certain scepticism amongst physicians towards collaboration with pharmacists. Next to that, there was neither an impact analysis nor implementation assessment plan performed by Socialstyrelsen upon publication of the national legislation and guidance documents. Regional and local implementation has mainly relied on the activity of key individuals.

Building sustainability

By performing a clinical study in Uppsala, it was eventually possible to show that the performance of medication reviews by a multidisciplinary team including a clinical pharmacist was effective and saved healthcare costs. Therefore, funding for these activities could be included into existing annual budgets instead of project funding. Next to that, more and more of such multidisciplinary teams were formed within this and neighbouring regions. However, at national level the implementation and quality of medication reviews have not been monitored and there seems to be no national plan to ensure continuous education and funding. Several steps need to be taken to assure national implementation. However, due to a changing political landscape and other important problems (e.g. increased inflow of refugees); the national focus on elderly care is attenuating.

Conclusions

Within all change management domains both presence and absence of factors for change have been identified throughout this case study. The most important factors identified are a presence of:

• National prescribing indicators and studies showing the urgency for change leading to public and political awareness;
• key driving individuals, champions within healthcare, university and governmental bodies leading to a broad collaboration at regional level;
• investment in education and the formation of multi-disciplinary healthcare teams at regional level;

And a lack or absence of:

• A common belief that medication review is an essential and effective intervention;
• knowledge and consensus on how and by whom exactly these reviews should be performed;
• a national strategy to fully implement and evaluate medication review legislation and policies.

This case study provides valuable insight into how and why medication review policies were developed and implemented in Sweden. New initiatives for further implementation should make use of change management strategies, taking into account all necessary steps and prerequisites for sustainable change. The identified existing barriers can act as a starting point for following measures in which the performance of medication reviews should be seen as an essential but not exclusive activity to improve the care for elderly with multi-morbidity.
6.1.3 Case Study Summary Catalonia (Spain)

Summary

The Spanish case study examined polypharmacy management in Catalonia. Two distinct models in different practice settings were identified: a government sponsored programme targeting complex chronic patients in primary care and an institutional network programme targeting older adults admitted to hospital, long-term care or nursing homes. The government sponsored model utilised a vertical approach to implementation, focusing primarily on patient safety and individual physician prescribing. The goal of this programme was to implement the programme in a standardised way throughout the entire primary care system. A major driver of this programme was the goals outlined in the Catalan Health Plan and the service contract between primary care centres and the government. In contrast, the institutional network model utilised a horizontal implementation strategy led by both clinicians and managers. The focus was on providing holistic patient-centred care via a multidisciplinary team, with polypharmacy management as one component. The goal was to create a scalable programme based on a small pilot. Key facilitators of this programme included a “culture of geriatrics” supporting the use of multidisciplinary teams and an institutional culture of innovation. These programmes illustrate how the challenges of polypharmacy can be addressed in different healthcare setting utilising different resources. Both programmes face challenges in effectively changing current practices to facilitate the full implementation and subsequent scale up.

Characteristics of the case study

Name of the programme

Government model: rational drug use

Medication management in the complex chronic patient: reconciliation, revision, de-prescribing and adherence

Institutional network model: patient-centred approach to optimising medicines management

Locality/region and country

The case study took place in Catalonia, Spain and included two distinct regions: Barcelona Esquerra, an urban centre, and Vic, a semi-rural town in central Catalonia. Clusters of institutions in each location included a teaching hospital, long-term care and primary care centres.

Health care system overview

Health care in Spain is devolved to the autonomous communities, and each community is responsible for delivering care within the guidelines established by the central government. Spanish law outlines the basic healthcare services each citizen is entitled to, training requirements for health professionals and reimbursement schemes. Each autonomous community establishes its own delivery model and sets its own regional and local priorities. In Catalonia, health care priorities are established in the Catalan Health Plan, a strategic planning document updated every five years.

The Catalan healthcare system is divided into the public payer or insurer, CatSalut, and care providers that contract with CatSalut. Contracts are made with both primary care centres and hospitals and the content of these contracts stems from the goals established in the Catalan Health Plan. To incentivise the uptake of new clinical practices or adherence to clinical guidelines, pay-for-performance measures are integrated into these contracts.
Each autonomous community in Spain is responsible for its own information sharing system. Catalonia has a strong network of electronic health information connecting primary care and hospitals, facilitating the sharing of patient information. Additionally, electronic prescribing is used almost universally, which allows for better tracking of medication histories.

Programme aims and objectives
The government sponsored programme targeted primary care providers in the public health system, specifically focusing on patients with complex chronic diseases. The objectives were to:

1) Improve patient safety and reduce drug related problems;
2) Improve health outcomes and control of chronic disease;
3) Improve adherence, and;
4) Improve healthcare quality and patient quality of life.

The institutional network programme targeted older adults admitted to an acute geriatrics unit. The goal was to create a holistic patient-centred care plan including a medicines management plan that incorporated the patient’s therapy goals, the evolution of the patient’s condition and the patient’s life expectancy with an ultimate goal of improving health outcomes and individual patient’s quality of life.

Institutions included in case study
Administrative institutions

- Catalan Ministry of Health: Government body overseeing delivery and financing of health care services in Catalonia.
- CatSalut: The organisation that ensures the provision of publicly provided health services to the citizens of Catalonia.
- Catalan Institute of Health: Public provider of health services in Catalonia, providing healthcare to 83% of Catalan citizens. Services include both hospital and primary care.

Institutions in Barcelona Esquerra

- Hospital Clínic Barcelona: Tertiary teaching hospital serving as the main public provider within Barcelona Esquerra. Also participates in managing affiliated primary care centres.
- CAPSE: Primary Care Centres in Barcelona Esquerra affiliated to the Hospital Clínic.

Institution in Osona

- Vic University Hospital: Acute care hospital serving as the public provider in the rural community of Osona. Part of the Vic Hospital Consortium.
- Fundació Hospital Santa Creu (Vic, Long term care), Residencia Aura (Manlleu, Nursing Homes), Residencia Nadal (Vic, Nursing Homes). Fundació Hospital Santa Creu is affiliated to the Vic University Hospital.

Barcelona Esquerra and Osona institutions were selected because they share Pharmacy services including management and staff.
Managerial and policy highlights of the programme

Moving from importance to urgency

Although there was clear agreement that polypharmacy is an important issue to address in Catalonia, there was not a sense of urgency around the issue. Adherence received less attention with a definite lack of urgency, partially stemming from the complexity of the issue and the difficulty in measuring and monitoring adherence. Both population and institutional data sources monitoring overall pharmaceutical use, spending and the quality of prescribing were key to highlighting the importance of polypharmacy. Larger demographic issues, such as an ageing population and decrease in health spending, also spurred innovation in this area.

Creating teams and strategic vision

The vision of health in Catalonia is informed by the Catalan Health Plan, a strategic planning document updated every five years. The priorities and objectives in the Health Plan are established within the legal requirements of the central government but reflect the local health needs and resources. The Health Plan outlines targeted priorities for the rational use of medicines in primary care, with less specific recommendations for hospitals.

Within the government sponsored model, there was less evidence of guiding coalitions or teams used to implement the polypharmacy and adherence management programme. The development of the guidelines was a team-based process but implementation depended on individual practitioners who were primarily working alone.

In contrast, the institutional network model had multiple levels of guiding coalitions, including alliances between institutions, strong working relationships between heads of departments and a core group of clinician leaders working to jointly implement the programme.

Creating practice models

Both within the government sponsored model and the institutional network model, a strong information technology system, with shared patient medical records and electronic prescribing information was seen as essential to the management of polypharmacy and adherence. Re-allocation of resources was also seen as essential. This did not always mean adding new resources: in the institutional network model, resources and responsibilities were shifted within the pharmacy department, creating an opportunity to institutionalise the new practice model. In contrast, in the government sponsored model new resources were not added and the workflow was not modified to accommodate the new practice, limiting the full uptake of the policy. Culture was also cited as a major facilitating factor. In the institutional network model, a “culture of geriatrics” where clinicians were already pre-disposed to working in teams, and addressing the patient in a more holistic manner, made the introduction of multidisciplinary teams possible. Another major facilitator was the contract for primary care services. Primary care physicians were required by contract to review the medication plans of patients identified with complex chronic conditions and received a financial incentive if certain pre-set targets were met.

Building sustainability

Measuring the impact of a polypharmacy and adherence programme was cited as a challenge in both the government sponsored and the institutional network models, both at the individual patient and the population level. Although there was agreement that evaluation was important, it was not clear
that the right things were currently being measured to properly evaluate a polypharmacy and adherence programme. To date, there has been no economic evaluation of either programme.

Conclusions
Catalonia has two examples of well-developed polypharmacy and adherence programmes which provide lessons for other healthcare systems taking into account what has already happened in Catalonia and what needs to happen for the programmes to reach their full potential.

- The culture of an organisation and of the particular medical specialty is important—starting in areas where a culture of multidisciplinary teamwork already exists will facilitate early success. An organisational culture of innovation also provides the foundations for a new programme.
- Any programme should be adapted to the resources at a given institution. The institutional network model was successful in part because there were highly trained clinical pharmacists already working in the hospital, so resources were shifted rather than added to start the initial pilot. The government sponsored model did not provide additional resources or re-purpose existing resources within the primary care setting.
- Catalonia has a very strong electronic health information system that is universally seen as a major facilitator to both programmes. The IT system facilitated monitoring of medicines use at the population and local level and created communication channels between individual practitioners.
- Official support of a programme, both from strategic planning documents and committees and in the form of contractual arrangements for services, lends credibility and facilitates the implementation of new programmes.
- Future evaluation efforts in Catalonia should assess the economic impact of these programmes, including harm avoided such as adverse drug events and hospitalisations. These data, which are currently lacking, are essential to the eventual scaling up of these programmes.
- Education of both clinicians and patients will also need to continue with further clarification of which clinicians are responsible for what tasks. Education needs to include both the technical aspects of conducting medication reviews as well as interpersonal skills to facilitate multidisciplinary teams and to encourage shared decision making with patients. The roles of additional providers, such as nurses and community pharmacists, should also be reviewed.
6.1.4 Case Study Summary Northern Ireland (UK)

Summary
Population projections for Northern Ireland (NI) predict a marked increase in the number of people aged 65 and over which is projected to increase by some 44% in the period 2014 to 2029 and by 74% by 2039. The priority in NI is to embed personalised care into daily healthcare practice for frail older people. The strategic direction includes a focus on: preventing disease progression, providing self-management care, personalised health care, optimising appropriate telehealth, improving prevention, early detection and risk prediction measurements and, importantly, involving older people as partners in care.

Many older patients have multiple co-morbidities, experience polypharmacy and complex social care needs. In NI, an integrated pharmaceutical care service was established, introducing a consultant pharmacist role tasked with case managing older persons. The consultant pharmacist leads a specialist team working at the acute, intermediate and community interfaces where they can act as medicines advocates for the older, vulnerable patient population with complex medicine needs while remaining an integral part of the multi-disciplinary healthcare team.

Characteristics of the case study

Name of the programme
A Regional Model for Medicines Optimisation in Older People

Locality/region and country
NI is a constituent country of the United Kingdom of Great Britain which is situated in the northeast of the island of Ireland. It has a population of approximately 1.8 million people, with two-thirds of these located around the capital city in the Greater Belfast area. NI has a single large commissioning body, the Health and Social Care Board, and five large health and social care trusts (HSC trusts) responsible for the delivery of primary, secondary and community health care. (Figures 1a & 1b)
Health care system overview

Northern Ireland (NI) has a single, publicly-funded, integrated health and social care system. The annual budget is in the region of £4.8bn.

The Department of Health (DH)\textsuperscript{10} is responsible for promoting an integrated system of health and social care designed to secure improvement in the physical and mental health of people; prevention, diagnosis and treatment of illness; and social wellbeing of people in NI. It endeavours to do so by:

- Leading a major programme of cross-government action to improve the health and well-being of the population and reduce health inequalities within NI Programme for Government. This includes interventions involving health promotion and education to encourage people to adopt activities, behaviours and attitudes which lead to better health and well-being. The aim is to support the population to increase their engagement in ensuring its own health and well-being; and
- ensuring the provision of appropriate health and social care services, both in clinical settings such as hospitals and General Medical Practitioner (GP) surgeries, and in community settings through nursing, social work and other professional services.

The DH under direction of the Minister of Health and the Legislative Assembly (with responsibilities devolved to it from the UK central government) sets policy direction and the legislative framework for the service.

Programme aims and objectives

The ultimate aim of the programme is to develop, test and scale up a Regional Model for Medicines Optimisation in Older People in intermediate care and care home settings within the Northern and Western Trusts of NI. Whilst the primary focus of the work will be to demonstrate similar or further improved outcomes from the current models, reproduced in two Trusts, this project will not work in isolation. The second aim of this work will be mapping out the processes in place for medicines optimisation in older people across all healthcare settings.

Institutions included in case study

Department of Health (DH); Policy and Strategy lead for healthcare in NI

The DH is one of 12 government departments created as part of the NI Executive. It is responsible for health and social care, public health and public safety for the NI population of 1.8m people. It is included as the strategy and policy lead of health and social care in NI.

Western Health & Social Care Trust (WHSCT)

The Trust provides services across 1,870 square miles of landmass and delivers services from a number of hospitals, community-based settings and, in some cases, directly in individuals’ homes, to a population of approximately 300,000 people.

Northern Health & Social Care Trust (NHSCT)

The NHSCT provides a comprehensive range of health and social care services to a population of almost 436,000 people across a geographical area of 1,733 square miles.

Both Trusts were included as they are the main sites for the delivery of the programme of care being considered in the case study.

\textsuperscript{10} Department of Health (DH) formerly titled Department of Health, Social Services & Public Safety (DHSSPS)
Managerial and policy highlights of the programme

The consultant pharmacist-led pharmaceutical care service for older patients was originally instigated in 2 Trusts (NHSCT and WHSCT) in NI in 2012. The programme of care is constantly evolving and proving to be reproducible within the Trusts involved. The positive outcomes from the programme mean that it is now likely to be rolled out on a regional level to all 5 Health Trusts, throughout NI between 2016 and 2019.

Moving from importance to urgency

The programme of care was launched as an urgent response to the needs of an increasingly ageing population and the resultant pressures placed on all medical resources. This allied to the evidence that a considerable percentage of hospital admissions were due to medication errors and adverse events meant that a joined up approach with direct access to all stakeholders was important. To maintain the sense of urgency the importance of steering the direction of travel needed to be emphasised. The role of the consultant pharmacist in delivering a specialised service was recognised as an important element in the process as well as including all stakeholders from the outset to ensure that everyone bought into the programme of care being delivered from the beginning and that they influenced the direction of travel.

It is vital that any response is coherent and effective as it must be sufficiently organised and supervised to ensure that all aspects are delivered as core practice. This is the integral sense-making part of the programme where the stakeholders come together to organise the practice to ensure the successful delivery of the programme of care.

Creating teams and strategic vision

The collective vision was that the consultant-led pharmacist pharmaceutical care of older people would be scaled up to become routine practice throughout the specific region of NI. There was a clear need for a strategic vision at the implementation stage of the programme of work.

Communicating the vision became vital to making sure that the team was motivated and able to champion the programme of care. One of the initial goals was the establishment of an impetus to ensure that barriers to the successful implementation of the programme were either removed or reduced to manageable proportions. Staff involved with the programme of change became empowered when successful outcomes and meaningful patient experiences were accomplished.

It became clear that the project had to fully involve all participants within the highly structured organisation represented by each HSCT to ensure that the delivery of the programme of care responded to the identified target group. The fact that the intervention model was likely to be complex should not hinder its chances of success if there was sufficient cognitive participation from all parties. The key informants emphasised the need to engage all stakeholders in the programme of care from the outset and to ensure that all stakeholders were working together to drive the programme forward.

Creating practice models

At this stage, accountability had to be built into the process for confidence to grow in the overall programme of care. It was, therefore, important that the correct allocation of work was made amongst the workforce and that correct policies and procedures were in place. The only means by which the project could hope to succeed was through the delivery of a model of practice which collectively defined and organised responses defined by need. For successful delivery of this
programme of care, the healthcare team needed to communicate and be cognisant of barriers which might affect their shared direction of travel.

**Building sustainability**

The programme had to be delivered in such a way as to engender confidence in initial positive feedback. It was of upmost importance to create short term wins to gain momentum and drive the programme of care forward. The programme of care team met regularly and these meetings served not only as a forum to inform the team of progress and outcomes to date but also to brainstorm and overcome emergent barriers. An additional unexpected benefit of these meetings was their value as a motivational tool for sustaining and directing the efforts of the project team.

Monitoring of the programme delivery was a necessity built in as an integral component from the outset. This helped to define and organise the assessment of all aspects of the programme of care from practice to assessed outcomes. It was recognised by all the key informants that a transparent monitoring process was integral to successful implementation of a regional scale-up of the programme of care.

As a direct result of the success of the project to date, the two consultant pharmacists who drive the programme have become recognised as key personnel in the tailoring of care for the target group on a regional and national basis.

All stakeholders recognised and acknowledged that accountability was key to sustainable change in healthcare for the elderly.

**Conclusions**

As we rise to the challenge of an ever-increasing ageing population taking multiple medications for multiple long-term chronic conditions, we have learned that we can use a structured change model or process theory to assist in achieving sustainable change. As we seek to improve the quality of care received by this population, implementation of a consultant-pharmacist-led pharmaceutical care programme was recognised as a dynamic intervention which could not only improve patient outcomes but also provide financial benefits to the healthcare sector.

Optimising the health benefits from medicines is an important enabler of active and healthy ageing in Northern Ireland. In March 2016, the Department of Health published a Medicines Optimisation Quality Framework (MOQF) to help people to gain the best possible outcomes from medicines. There is a formal policy commitment to implementing the Framework through an innovation and change programme which seeks to develop, test and scale up best practices to support a national medicines optimisation model. The model outlines the activities that people can expect when medicines are included in their treatment in four key settings of hospital, general practice, community pharmacy and social care. Implementation commenced on 1st April 2016 with an immediate focus on supporting appropriate polypharmacy and improved adherence in older people through the scale up of the older person’s model featured in the Northern Ireland case study.

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6.1.5 Case Study Summary Germany

Summary
Germany has one of the world’s most rapidly ageing populations. The impact on health care provision will be enormous. Multiple chronic morbidities are common among older citizens and multiple medications are needed to keep people’s health under control. However, such polypharmacy poses serious health risks if inadequately applied. Especially in Germany, where patients have direct access to GPs and specialists in primary care and consultation rates are traditionally high, medication tends to mount up with every medical appointment. Medication checks are not an explicit part of health insurance schemes. Health policymakers have become aware of the problem and are seeking solutions.

This is where the regional training programme, ATHINA, comes in. Initiated by the Chamber of Pharmacists, ATHINA encourages and enables community pharmacists to perform medication reviews. So far, the role of pharmacists has been primarily to supply medications rather than taking an active part in patient care. The introduction of ATHINA has underlined pharmacists’ discontent with their currently under-utilised medical role. Already, within 2 years of its launch, 10% of all pharmacists in Lower Saxony have participated in this voluntary programme. Performing medication reviews in practice does, however, present challenges. There is a low demand from patients who have to pay for this service; reviews are based on patient statements and cannot utilise clinical data due to the lack of inter-connectedness of ICT-systems; medication analyses are time-consuming and interfere with the regular pharmacy workflow. Moreover, doctors also lay claim to medication checks and expect appropriate remuneration. ATHINA represents a crossroads in our healthcare system. To sustain and expand it, the specific role of pharmacists as partners in professional medical care needs to be politically established. Moreover, to make savings on the time required for the medication review, the long-awaited e-health law requires implementation, so that patient data can be shared between professions rather than repeatedly collected in isolation without reconciliation.

Characteristics of the case study

Name of the programme
ATHINA is a training project involving community pharmacists who perform medication reviews for patients with polypharmacy. It is run and partly sponsored by the Chamber of Pharmacists.

Locality/region and country
ATHINA runs in four out of 16 German states. This case study takes place in Lower Saxony.

Health care system overview
Health insurance is provided by competing, not-for-profit, non-governmental sickness funds. Every German citizen must belong to a sickness fund - either a statutory fund for employees or a private fund for self-employed people and high-earners (only 10% of insured people). Insurance payments are based on a percentage of income. Prescription fees are small. Outpatient services are largely the responsibility of community doctors (general practitioners and specialists). They are represented by the Association of Statutory Health Insurances in each German state, which negotiate doctor remunerations with the health insurance companies. The Federal Ministry of Health has an overarching responsibility to safeguard the statutory health care system. It does this through a legal framework (Social Code V) which acts as a code of practice for health care institutions, health
professionals and patients. The Federal Joint Committee interprets the legal framework into working regulations. The most relevant stakeholders in health care participate in this discussion so that broad discussion and their involvement are ensured. Only licensed doctors are permitted to prescribe; and legally each doctor is responsible for their own prescriptions. Pharmacists are merely allowed to supply medications. This longstanding situation has changed as of 2012 since when pharmacists have been permitted to perform medication reviews. Moreover, they are now encouraged to perform joint pilot projects in the field of medication management. Likewise, a bill has just passed through statute on the implementation of the “e-health” card. This electronic card will be owned by every patient; it contains the insurance status and some health related data, especially the up-to-date medication plan. It facilitates the sharing of patient information between health professions with the consent of patients.

Programme aims and objectives

The aims of the ATHINA programme are two-fold:

- Patients shall benefit by being made aware of inappropriate polypharmacy and the consequences of non-adherence to prescribed medications.
- The role of pharmacists shall be expanded from merely providing medicines to influencing therapeutic actions in partnership with doctors.

Institutions included in the case study

The Chamber of Pharmacists was included on the management level. It is a self-governing body and responsible for the academic and further education of pharmacists; it safeguards professional law and pharmaceutical safety and quality. Membership is mandatory for every German pharmacist.

Three community pharmacists in three different areas of Lower Saxony were included. All three pharmacists had undergone the ATHINA training. One pharmacist was involved in the training programme as a trainer. Two patients who experienced a medication review in their pharmacies took part.

Managerial and policy highlights of the programme

Moving from importance to urgency

German pharmacists are active in health policy. As published in their Vision 2030 they aim to extend their professional role from primarily a retailer of medicines to an equal member of the health professions. They argue that the rapidly ageing German society requires adequate and safe treatment of their multiple chronic diseases. The main aim is to optimise pharmacotherapy and minimise the risks involved. At present there is a gap in ensuring safe drug treatment. Pharmacists perceive that general practitioners often do not have the time to oversee and analyse the patients’ changing medications prescribed by various physicians. Pharmacists want to prepare themselves for exactly this task and consequently have started to upgrade and expand their competencies in creating the training programme ATHINA. “The professional qualification of the pharmacist is our future” is a quote from the president of the Chamber of Pharmacists.

Creating teams and strategic vision

The ATHINA training programme enjoys great popularity amongst pharmacists. Since its launch in May 2014, 500 out of 5000 pharmacists in Lower Saxony have subscribed to it. The Chamber of Pharmacists actively advertises the training programme via newsletters, personal correspondence...
and publicity material. The community pharmacists generally support the initiators’ messages of urgency: “We have to offer more to the patient and build a service that goes beyond the mere issuing of drugs. ...We want to assume responsibility for the pharmacotherapy, because this is what we were trained to do in the first place”. Doctors on the macro- and micro-level are perceived to oppose the pharmacists’ endeavours. The Chamber of Pharmacists is also concerned that the responsible health politicians do not sufficiently consider the role of pharmacists for the management of polypharmacy.

Creating practice models

ATHINA is foremost a voluntary training programme enabling community pharmacists to undertake medication reviews. It consists of a 16-hour seminar plus the presentation of four medication reviews evaluated by a pharmacist tutor. On-going seminars offer further training. The medication review which is standardised with documentation IT-facilitated. Having completed the training, pharmacists receive the ATHINA certificate and are thus equipped to perform medication reviews with patients. The medication review is recommended for patients on five or more drugs.

ATHINA is subsidised by the Chamber of Pharmacists so that fees are low. The practical guidance and exercises of the seminar facilitate easy transfer into practice and personal tutors are available to answer any questions. ATHINA also offers an electronic entry form for the medication review and automatic print outs for patients and other health professionals.

The implementation of ATHINA into routine practice, however, poses some difficulties. There is a low demand from customers who have to pay for the review. Some also feel that it undermines the trust in their doctor by asking a pharmacist to check the medication. Pharmacists perform an intermediate review (PCNE-Type 2), consisting of a “brown-bag-review”, which means that patients bring all their medications for a pharmacist to check. It covers checking drug interactions, side-effects, unusual dosages, adherence issues, possibly drug-food interactions and a subsequent pharmacist consultation. Clinical information from doctors is restricted by law and this limits the scope of analyses and recommendations. The reviews create time management issues within the pharmacies so that they are done outside of the working day. The ATHINA programme is not interoperable with the software being used by pharmacists, necessitating the double entry and introduction of typographical errors in patient information. This practice impinges on the practicality and consequently limits its widespread use. Finally, patients are sometimes reluctant to discuss the recommendations made by the pharmacists with their doctors who actually do the prescribing.

Building sustainability

ATHINA is at a crossroads. There is a danger that it will become a luxury add-on unless some further steps are taken. It needs to demonstrate benefits - an analysis of the first medication reviews is imminent. It also needs to improve the practicality of the medication review. The Chamber of Pharmacists, therefore, eagerly awaits the implementation of the “e-health law”. It promises to solve the problem of exchanging patient data through common IT-interfaces so that time-consuming double entries will no longer be necessary. The Chamber of Pharmacists is also aware that gaining more support from health politicians is essential. Widespread dissemination is only achievable if medication reviews by pharmacists become part of health service contracts with appropriate remuneration. This will also facilitate the necessary co-operation with doctors.

Conclusions

At present the absence of comprehensive medication reviews for patients on polypharmacy constitutes a significant gap in health care. Pharmacists want to fill this gap, as the interviews with
them revealed. ATHINA is one of several pilot projects that engage pharmacists in medication reviews in Germany.

- The timing of the launch of ATHINA is politically and socially right. Health politicians are aware of medication safety issues for patients with polypharmacy and seek solutions.
- Pharmacists pursue a vision of a more clinical role. ATHINA prepares pharmacists for this clinical role.
- Community pharmacists demonstrate a good acceptance and meeting of standard competencies in the training programme.
- The practice of performing reviews is not problem-free. There is a low demand from the paying patients, the review is time-consuming and doctors are not automatically notified.
- For a nationwide roll-out, several points will have to be achieved: health care contracts for undertaking medication reviews, appropriate remuneration, electronic sharing of patient data, shorter time for pharmacist-led medication reviews, and gaining acceptance from doctors.

“And one week after [the medication review] I went to the pharmacy and he explained it all. Meanwhile he had already spoken to my GP … because I had said that I wanted my GP to know about it. He (the pharmacist) has done all this and it has turned out very well”
6.1.6 Case Study Summary Portugal

Summary
Portugal lacks any polypharmacy management program, and has no prospects for one in the near future. In addition to the lack of a polypharmacy programme, scientific literature also shows scarce concern for polypharmacy management and medication adherence in Portugal. The studies are limited to some hospital services or nursing homes, with few studies in primary care and ambulatory patients. Principal factors contributing to the absence of polypharmacy management programmes in Portugal include: lack of awareness due to the absence of national studies; deficient IT systems in healthcare institutions and lack of multidisciplinary culture in healthcare teams. Additionally, the implementation of cost-effectiveness policies in last recent years due to the serious economic crisis and significant cost restrictions prompted:

- A reduction in the number of healthcare professionals;
- a reduction in the investment in new technologies;
- limitation in the introduction of new drugs;
- reduction of medicines’ reimbursement by the Government;
- an increase in user fees;
- intensification of medicine price control by the Administration; and,
- with further examples on a more minor scale.

The Portuguese healthcare system ("Sistema Nacional de Saúde – SNS") is publicly funded with the majority of healthcare services community based. Healthcare expenditure and medicines consent and consumption is regulated by different organisations administered by the Ministry of Health which is under National Government authority. So, in order to implement a sustainable polypharmacy management programme in Portugal, more efficient communication between the Ministry of Health and the organisations working under its authority would be necessary.

Characteristics of the case study

Name of the programme
Room for polypharmacy management programmes in Portugal

Locality/region and country
Portugal

Health care system overview
The Portuguese Health Service (“Sistema Nacional de Saúde – SNS”) is publicly funded with the majority of healthcare services community based, though; we have seen in recent years a trend for an increase in the private sector, specifically the recent appearance of more private hospitals. Governmental healthcare funding rates vary according to patient’s income, type of chronic healthcare condition and of their health subsystem, but usually patients’ co-payment covers 35% of the price of medicines, diagnostic examinations, medical appointments and emergency care visits. In the case of special healthcare regimes, such as patients with specific chronic conditions (e.g. AIDS/HIV, rheumatoid arthritis, etc.), or medicines requiring controlled distribution, or with high cost, patients are prescribed by hospital physicians and their medicines are freely provided through hospital or community pharmacies. In Portugal, prescription medicines are exclusively
prescribed by physicians and are mostly dispensed in community pharmacies. Primary healthcare centres are provided with physicians, nurses, and other professionals under contract. Pharmacists have never been hired in any of these healthcare centres.

**Programme aims and objectives**

In Portugal, there is no programme about polypharmacy and no agenda to implement such a programme exists or is being considered for the near future. Moreover, there is no regulation for the prescription or dispensing of new medicines to a patient under polypharmacy. There is also no regulation on the review process of the medicines prescribed and an absence of educational activities to perform with patients under polypharmacy.

**Institutions included in case study**

Several key informant interviews and one focus group were conducted with invited healthcare professionals (physicians, nurses, pharmacists) from Portuguese public hospitals and primary care centres; representatives of the Regional Healthcare Administrations (Administração Regional de Saúde – ARS); representatives of the Portuguese Pharmacists Association; representatives of patients (Alzheimer Portuguese Association – Coimbra branch); and academics of higher educational institutions (medical, nurse and pharmaceutical sciences schools).

**Managerial and policy highlights of the programme**

**Moving from importance to urgency**

In Portugal, one of the clearest reasons for the absence of a polypharmacy management programme is the lack of awareness and the absence of urgency concerning this health issue. In fact, scientific literature shows scarce concern about polypharmacy management and medication adherence in Portugal. The few studies published are limited to some hospital services or nursing homes, with few studies in primary care and ambulatory patients. Additionally, the non-existence of a multidisciplinary team culture among healthcare professionals is contributing to a delay in the recognition of this health issue. According to the Portuguese case study results, most of the health care professionals assume their profession skills could make a crucial contribution to reduction of polypharmacy and improve patients’ adherence. Another factor contributing to the absence of a polypharmacy management programme in Portugal, and making it difficult for any future implementation, is the lack of efficient IT systems. This is mostly due to the lack of commonly used software to register patients’ data and lack of interoperability and compatibility needed to allow sharing of information between different healthcare units (including hospitals and primary care). Consequently, the lack of a common patient registry file does not allow the monitoring of polypharmacy situations. The economic crisis of recent years has worsened the problem due to the reduction of healthcare costs by application of cost-effective policies and diminishing human resources.

**Creating teams and strategic vision**

Changing organisational culture, improving interprofessional communications, involving healthcare administrators and administrations were seen as pre-requisites to the implementation process.

Policy making around healthcare expenditure and medicines authorisation and consumption is centralised under National Government authority. In order to implement a sustainable polypharmacy management programme it would be necessary to create a more efficient communication system between the Ministry of Health and the several bodies working under its authority, namely, Infarmed.
(the Portuguese medicines agency), ACSS (Central Administration of the Healthcare System), DGS (The National Directorate of Health) and also the regional bodies like the ARSs (Regional Administrations of Health).

Healthcare professionals (physicians, nurses, pharmacists), representative of Regional Healthcare Administration, representatives of patients and academics who participated in this process have a vision of comprehensive groups which should include practitioners, academics and administrators from all the professions potentially interested in future polypharmacy programmes. The lead group could be an existing group from a family care centre, or could be created de novo with selected profession leaders. Probably due to the lack of polypharmacy management programmes in Portugal, the vision idealised by the informants may be considered as simplistic and quite generalist. However, the creation of multidisciplinary teams, increasing the investment in primary care and placing the patient in the centre of the system are viewed as potential solutions for polypharmacy and adherence problems.

Creating practice models

One of the main barriers to implementing a polypharmacy management programme in Portugal is the lack of common software for primary and secondary care that could allow the creation of unique, shared patient medical records, as well as the existing restrictions to access patients’ data due to data protection issues. Other barriers for the implementation of a polypharmacy management programme are related to expenditure control, including reduction in the hiring of healthcare professionals; reduction in investment in new technologies; reduction in the public funding of medicines, and rising of the user fees; and restraining the introduction of new and high price medicines. The poor coordination between local, regional and central authorities within the Portuguese Health System (SNS) also affects the implementation of any national programme.

To counter the lack of a tradition of working in teams, there should be clearly defined job descriptions for each of the professionals involved and communication and interprofessional relationships should be supervised by healthcare authorities. Interprofessional communication should be improved in Portugal. Clinical sessions were suggested as one of the opportunities to facilitate this interprofessional relationship. Some other measures observed within the Portuguese Health System could act as facilitators to implementation of a polypharmacy management programme in the future, such as electronic prescribing. Finally, the existing model of the National Health System is seen as an optimal model to implement a polypharmacy management program: publicly funded and accessible to all citizens, and the fact that all health system units/organisations are centrally administrated by the Ministry of Health and under the Government authority.

Building sustainability

The involvement of official structures of the National Health System (“SNS”) and the Ministry of Health are necessary to long-term implementation of a polypharmacy programme in Portugal. Incentives for professional were frequently cited as a personal short term win. These incentives could differ from economic to motivational awards. Economic incentives, such as extra remuneration, are welcomed by professionals of the National Health System and of the community pharmacies. The motivational incentives may include for instance: the positive feedback to practitioners, by means of reporting results of studies; and the maintenance of quality assurance groups and specific meetings among different teams. In addition, it was mentioned that any change will potentially need law enforcement to regulate the service.
Conclusions

Portugal lacks any polypharmacy management programme with no prospects for any in the near future exist. Several factors were defined as contributing to the absence of polypharmacy programmes in Portugal, namely:

- Lack of awareness due to the absence of national studies. The scientific literature about polypharmacy in Portugal is scarce. Studies are limited to some hospital services or nursing homes, with few studies in primary care and ambulatory patients.
- Inadequate IT systems in healthcare units (including hospital and primary care). Portuguese healthcare IT system was heavily criticised due to poor applicability and frequent system failures. Several potential causes may be under this situation, but the lack of commonly accepted software seems to be the most important.
- Expenditure cuts. Financial cuts are a common problem in many countries, but these cuts started in Portugal before the global financial crisis. This prompted the implementation of cost-effectiveness policies and significant pressure on expenses leading to: a reduction in the number of healthcare professionals; reduction in the investment in new technologies; limitation on the introduction of new drugs; reduction of medicines’ reimbursement by the Government; increased user fees; intensification of medicine price control by the Administration.
- Lack of multidisciplinary culture among healthcare professionals. In fact, most of the health care professionals assume their professional skills and training could make a crucial contribution to decrease polypharmacy and control patients’ adherence in Portugal.
- Regarding pharmacists services, a vicious circle was identified. The lack of previous collaborative experiences hampers the initiation of new collaborative services, both with physicians and nurses. An immediate consequence of this situation is a decline in pharmacists’ perceived responsibilities, even in hospital pharmacy environment.

However, some measures already implemented in the Portuguese National Health System could help to facilitate a polypharmacy management and patients’ adherence programme in the future. Namely, the electronic prescription already in use; the fact that our National Health System is being publicly funded and accessible to all citizens; and that all health system units/organisations are centrally administrated by the Ministry of Health and under the Government’s authority, facilitating the implementation of national strategic measures.
6.1.7 Case Study Summary Italy

Summary

No official policy statements or regulatory guidelines on polypharmacy have been released to date by Italian Health Authorities. However, it should be acknowledged that the growing awareness of the problem has been documented by the release of observational studies on this issue by national study groups and scientific societies.

Medication reviews, conducted by application of appropriateness criteria and computerised decision support systems are approaches designed to improve the quality of prescribing for older people. In order to implement such strategies, more focused training courses on multimorbidity and polytherapy management are mandatory within healthcare curricula. Furthermore, the integration to a multidisciplinary team (physicians, pharmacists, and nurses) may positively impact on:

- Reducing the prescribers’ sense of fear to discontinue or substitute drugs prescribed by others;
- reducing the drug therapy fragmentation among different specialists;
- reducing costs; and,
- improving adverse drug reaction detection and reporting.

Lack of management programmes and/or working policies in Italy regarding polypharmacy prescription and adherence to drug therapy and management, particularly among older adults, stimulated the design of a pilot study aimed at providing an evidence-base of the current status of polypharmacy in Italy. Focusing on the Campania Region, and on Naples metropolitan area, data were obtained from a large tertiary care hospital (in particular from several Departments of Federico II University Hospital) representing the current protocol applied when prescribing for older patients with excessive polypharmacy. A multidisciplinary approach starting with identification of patients at risk of drug-related problems, followed by medication review over a period of time and the application of inappropriateness criteria, supported by computerised decision support and electronic prescribing systems, was embedded in the comprehensive geriatric assessment aiming to achieve the best-tailored pharmacotherapy for each patient.

Characteristics of the case study

Name of the programme

View on polypharmacy in Italy

Locality/region and country

Naples, Campania Region, Italy

Health care system overview

The global economic and financial crisis is having a strong impact on the Italian healthcare system. Therefore, in 2001 there was a devolution process from the central government to regions, setting “essential care levels” (Livelli Essenziali di Assistenza or LEAs), a package of benefits that are publicly funded and must be guaranteed to all citizens in all regions. Most essential drugs are included in LEAs. This law (no. 405/2001) established the possibility for each region to adopt co-payment policies for citizens to contribute to the cost of pharmaceuticals by a fixed amount per prescription, ranging from 1 to 5 euros, depending on the region. Patients can benefit of an exemption from co-payment in case of low income or affection by specific chronic diseases. Also the exemption policies are decided on a
regional basis. Therefore, the regionalisation process established cross-regional variation. About one third of the regional governments, mainly in the central and southern part of the country, are facing substantial financial deficits. Today, Campania is one of the regions in payback plan. The Italian health care system is supported by the National Health Care fund and is determined on a yearly basis through the Balance Approval National Law. Then each region takes care of unifying the health care performance through regional laws, distributing their percentage assigned from the Health care fund among local health units. Moreover, in light of the global economic and financial crisis, tighter cost-containment measures on public health expenditure have been proposed and are being slowly implemented (e.g. caps on specific spending areas). At the same time, higher co-payments for outpatient/ambulatory care; diagnostics and drugs have been introduced, adding to private spending on health. The central issue with health service delivery is the heterogeneity of regional arrangements. In general, northern and central regions appear to keep pace with institutional, organisational and professional developments aligned with best international practices and in line with central government orientations, while southern regions appear to lag behind. The gaps between northern and southern regions mainly reflect socioeconomic and cultural factors that are far beyond the health-care system. However, it is also likely that decentralisation policies introduced in the last two decades have not favoured the health equity of regional systems, as they provided opportunities for improvement to the best institutionally equipped regions while leaving southern regions with less central support to cope with more difficult social contexts, that cannot be addressed solely by policies aimed at economic balance. For example, support for preventive interventions and strategies of health promotion, when horizontal cuts are applied, lag behind and the focus switches to disease management rather than to approaches that demonstrate their sustainability in the medium-long term. Infrastructures aimed at exploiting evidence through tailored health information systems can help reduce the gaps in health equity to a more equitable social and health service provision, especially when paralleled by strong approaches to citizen empowerment and lifelong learning. In addition, important achievements in terms of waiting lists, continuity of care and patient centeredness, as well as integration between social and health care, are negatively affected by unprecedented horizontal resource cuts. These cuts are likely to cause a paradoxical effect on health outcomes, leading to a lack of or inadequate programmes for polypharmacy management and prescription adherence.

Programme aims and objectives

Polypharmacy and medication non-adherence in the older population are growing public health issues throughout the European Union (EU), and are critical issues in integrated care. Older persons who are affected by multimorbidity are prescribed polypharmacy and they are at high risk of over-prescription, inappropriate use of medications and drug-related problems.

In Italy, healthcare professionals have acknowledged the absence of key policies and procedures focusing on polypharmacy management in older adults. Some regions developed polypharmacy consensus papers or local policies (Toscana, Lombardia, Emilia Romagna). These documents also suggest some warnings on potential inappropriateness prescription in the elderly. Although the stakeholders have an awareness of the need to develop strategies for polypharmacy management, there is a lack of policies at a national level and a clear need for development of a comprehensive practical guideline.

This case study aims to provide insight into a) why policies regarding polypharmacy and adherence in Italy have not been implemented; b) how relevant programmes could be developed, implemented and evaluated including possible barriers and facilitators of change.
Institutions included in case study

Federico II University Hospital, the largest tertiary care hospital of Campania Region. It is a facility for the entire region (>5,800,000 residents) and neighbouring areas. Its mission is integrating research, training and health service provision, for which its involvement can ensure a multidimensional approach to innovations. Furthermore, it provides expertise in the field of Internal Medicine, Geriatrics, Clinical Pharmacology, Multimorbidity and management of complex prescription regimens. Its integration with Federico II University ensured multidisciplinary expertise, such as with its Centre of Regional Relevance for Drug Prescription and Appropriateness Analysis (CIRFF). CIRFF has been contributing to the involvement of pharmacists to the implementation of the pilot study.

Managerial and policy highlights of the programme

Moving from importance to urgency

The absence of key policies and procedures in Italy focusing on polypharmacy management in older adults emerged from our case study. This could be ascribed to the heterogeneity in health policies among different Italian regions. In fact, Italy is characterised by a National Health System, which is differently planned, administered and organised at the regional level. Hence, local results on inequalities in health services utilisation can be interpretable with specific reference to the regional context; therefore, scaling up data at national level is desirable. Moreover, it should be highlighted that, in Italy, the role of clinical pharmacist is still being defined. Community pharmacies are developing more comprehensive approaches to pharmaceutical care, but process is still at an early stage. Although, in 2009, it was approved by National Law (no. 69/2009) that the role of community pharmacy which was intended as a multipurpose centre of services. This Law is still far from being fully implemented. This is due to a number of factors:

- Slow increase in political interest in promoting the role of pharmacists as caregivers.
- Absence of financial investments to support this kind of service.
- Poor organisation and communication between stakeholders both at local and national level.

Overall, therapeutic review and reconciliation are two mandatory steps in both the prescribing process and the de-prescribing process (the process of tapering off or stopping drugs). In fact, the same good practices and principles should be applied when a drug therapy is initiated and when it is discontinued. However, tools to assess quality of prescribing and avoid inappropriate drug prescriptions should be implemented. During the last few decades, much effort has been directed towards improving the quality of drug prescription in older adults, and several criteria have been developed. However, the lack of data integration and interoperability of ICT solutions in healthcare is a national issue in Italy. In 2016, Italy is still lacking a nationwide e-health record. In addition, pilot studies do not translate well in regulatory actions of the National Health System. Several pilot studies have been conducted in Italy; however, data obtained were not well received at Ministerial level and not translated into formal guidelines or policies.

In our case study, an increase in awareness on polypharmacy and its logistical effects on economics, ethics and health-related issues has been detected. A multidisciplinary team approach including general practitioners (GPs), consultants, pharmacists, nurses and pharmacologists has been proposed to optimise therapeutic strategies in patients prescribed polypharmacy. The teamwork practices are to be supported by ICT.
Creating teams and strategic vision

The optimisation of prescribing processes in the elderly is emerging as a mandatory element for healthcare systems. However, in polytherapy management, the problem is not just the drug therapy in itself, but also the appropriateness of diagnostic pathways in order to rationalise resources for each patient. A multidisciplinary team (physicians, pharmacists and nurses) should work together in order to define the best strategy for polytherapy management, appropriateness and de-prescribing. Stakeholders should be encouraged to allocate resources to this healthcare area.

Creating practice models

In Italy, the absence of key policies and procedures on polypharmacy management strongly impact on current clinical practice. Fragmentation of therapy among and between different specialists and GPs is relevant, highlighting the lack of coordination among healthcare professionals. The lack of resources due to cutbacks, together with the healthcare system regional devolution, negatively impacts development of polypharmacy management policies. This case study revealed that a multidisciplinary approach represents the best strategy for polypharmacy management. At least at the initial step, case study participants suggested enrolling only healthcare professionals who are already motivated and accepting a multidisciplinary approaches at work. Resistance to change (cultural barriers) is a major issue for polypharmacy management: communication between different healthcare professionals should be implemented in order to build solid multidisciplinary teamwork. University training courses and curricula specifically focused on polypharmacy and adherence programme should further support polypharmacy programmes. These programmes should be delivered to medical, pharmacy and nursing students. Healthcare Professional Councils should be engaged to support the initiatives related to polypharmacy and adherence review programmes; as well as pharmaceutical industries which should be involved in the initiatives related to polypharmacy and adherence review programmes. GPs should be consulted and encouraged to reduce their workload by delegating agreed tasks to other healthcare professionals (pharmacists and nurses) to make the most of the skills of each healthcare profession. In line with other countries, community pharmacies should be integrated to GP practices for polypharmacy and adherence review programmes; and clinical pharmacist (working on hospital medical wards) should be fully adopted and engaged as health care professionals in Italy. Finally, health ICT infrastructure may help to support implementation, communication and monitoring of a programme.

Building sustainability

A pilot study specifically focused on a polypharmacy and adherence management programme (“FRIENDD”, Farmaci Rivisti Insieme: Empowerment nelle Diverse Discipline) has been proposed. This pilot study aims to involve patients with chronic diseases from different hospital wards (Internal Medicine, Geriatrics, Rheumatology, Endocrinology) to set-up, test and implement a procedure to revise their prescription regimens in collaboration with the Pharmacosurveillance Unit of the hospital. The primary objective of this pilot study is to evaluate the polypharmacy regimen in elderly patients aiming to improve the appropriateness of the prescribing. A multidisciplinary team (clinical specialists, clinical pharmacologists; clinical pharmacists) will systematically review the drug regimens in patients with at least two chronic diseases and taking more than six drugs.

The findings of this project will be illustrated to Campania Region decision makers and to the ProMIS network of Italian Regions, in order to elaborate specific pathways for polypharmacy management at local, regional and national levels.
Conclusions

This case study provided insights into a) why policies regarding polypharmacy and adherence in Italy have not yet been implemented; b) how relevant programmes could be developed, implemented and evaluated highlighting any possible barriers and facilitators of change.

The main findings of this case study are that:

- Pilot studies should be designed to create evidence on outcomes of polypharmacy in elderly comorbid patients;
- stakeholders should be actively involved in designing and implementing polypharmacy management programmes;
- stakeholders should be sensitised to allocating resources to polypharmacy management programs;
- specifically focused educational programmes are the foundation for success in polypharmacy programme development;
- healthcare Professional Councils and Universities delivering healthcare professional education programmes should actively support and promote polypharmacy programmes;
- a multidisciplinary approach, starting with identification of patients at risk of drug-related problems, followed by medication reviews over a period of time, and the application of inappropriateness criteria, supported by computerised decision support and electronic prescribing systems need to be embedded in the comprehensive geriatric assessment. This should be adopted with the aim of achieving the best-tailored pharmacotherapy for each patient.
6.1.8 Case Study Summary Poland

Summary

Polish healthcare systems, together with other European Union (EU) countries, must face the problem of rapid ageing of our societies. The increase in population of those aged 65+ will affect the average number of medications taken by patients due to their multimorbidities, longer lifespan and progress in pharmaceutical research. Due to this fact, polypharmacy in next few decades will be one of the major challenges for Polish healthcare. Although several countries in the EU have addressed this issue, there are still many Member States in which no policies regarding polypharmacy have been approved, one of which is Poland.

Our case study was a thorough analysis of the current state of the art. Beginning with a systematic desk review, which returned no existing policies or guidelines on polypharmacy in Poland, it was confirmed that Poland lacks regulations in this matter. Key informant interviews and focus group studies revealed several major barriers to effective implementation of polypharmacy and adherence management policies. One of them was the lack of effective communication between healthcare professionals. At the moment in Poland, there is no nationwide electronic patient record which could help transfer information about patients, their health history, results and more between physicians, pharmacists, nurses and the other specialists. This summary presents a brief description of the findings of this study, and particularly, of the barriers that need to be overcome should effective policies against improper polypharmacy in the elderly be adopted in Poland.

Characteristics of the case study

Name of the programme

View on polypharmacy in Poland.

Locality/Region and country

This case study was provided for Poland as a whole with a special interest in polypharmacy management in the elderly in Lodzkie province (with Lodz city, region capital) and Malopolskie province (with Krakow city, region capital).

Health care system overview

Poland has a stable and growing economy. During the global recession of 2008, Polish gross domestic product (GDP) increased by 1.6%, while at the same time GDP of the EU as a whole decreased by 4.5%. Due to this fact, Polish economy has risen to Purchasing Power Parity $26,135.3 GDP per capita in 2015. Although the Polish economy is stable, the country needs many reforms in order to improve its global potential. One of the fields which needs constant improvement is healthcare.

The Polish health care system is publicly funded. It is free for all Polish citizens who have insurance in the National Health Fund (in polish ‘Narodowy Fundusz Sdrowia’, NFS). Approximately 92% of the population is covered by the system of compulsory health insurance. The rest has no insurance due to various reasons amongst which the most common are: patient did not apply for insurance, his parents did not do it (in case of children) or his employer did not do it, mistakes in application for insurance or lack of paid contributions by self-employed entrepreneurs. Management and financing functions in the Polish health care system are divided between the Ministry of Health, the NFS, and territorial self-governments. The Ministry of Health has the overall responsibility for governance of
the health sector and its organisation. It is responsible for national health policy (including medication prescribing and prescription regulations), implementation and coordination of health policy programmes, development of guidelines for health promotion and disease prevention programmes, elaboration of solutions to health problems, caused by environmental and social factors, and, jointly with the provinces (voivodeships), evaluation of access to health care. It is also in charge of financing of a few public health institutions (e.g. Institute of Mother and Child, Institute of Cardiology). The NF is responsible for financing health care services provided to the insured population. It is done by negotiating and signing contracts for service provision with health care providers (setting their value, volume and structure), monitoring the fulfilment of contractual terms and being in charge of contract accounting. It manages the process of contracting health services with public and non-public service providers. Territorial self-governments are responsible for maintaining capital investments in healthcare infrastructure and for health promotion and prevention.

In Poland physicians, dentists, veterinary doctors and physician assistants (feldshers) have authority to prescribe medications. The Minister of Health’s act allowing nurses and midwives to prescribe has been recently approved. The Act is being implemented with nurses and midwives required to pass a certificated course in order to prove competence and gain authority to prescribe. To date, approximately 100 nurses have passed the certification course.

Programme aims and objectives

At the moment in Poland there is no legislation that supports directly or indirectly the polypharmacy programme. Polish acts omit management of medications, thus legislation neither supports nor hinders implementation of a polypharmacy programme. For that reason, the Polish case study focused on identification of barriers and limitations to implementation of a polypharmacy management programme.

Nonetheless, the first step in designing a polypharmacy management programme has been taken with the creation of a working group appointed by the Ministry of Health tasked with developing a pharmaceutical care programme. Its main objective is to prepare a plan of publicly financed pharmaceutical care in Poland. In 2004, the FONTiC (Polish: Farmaceutyczna Opieka w Nadciśnieniu Tętniczym i Cukrzycy; English translation: Pharmaceutical Care in Hypertension and Diabetes) project was started in Lubuskie province as a first step of pharmaceutical care development in Poland. It resulted in the development of an Internet based application to help pharmacists deliver pharmaceutical care. The software enables pharmacists to prepare, analyse and correct pharmaceutical care plans and patient education.

Institutions included in case study

- Ministry of Health – responsible for national regulations in health care.
- National Health Fund (Polish Narodowy Funduszdrowia) - responsible for financing health care services provided to the insured population.

Managerial and policy highlights of the programme

Moving from importance to urgency

Rapid ageing of societies is one of the main demographic problems in European Union member states, including Poland. Between the years of 1989 and 2014, the number of elderly Polish people increased by over 2.9 million. Rising numbers of people in those aged older than 65 contributes to a higher risk of polypharmacy due to the increased prevalence of multimorbidity in this population.
This problem has become more urgent these last few years, however, no specific actions have been taken by policymakers. Furthermore, participants did not express any concern at the lack of polypharmacy management policies which were not viewed as a major problem for Polish healthcare. There may be several reasons for this, including more urgent problems in healthcare, a lack of polypharmacy knowledge among policymakers and a strong pharmaceutical lobby to name a few. One of the case study interviewees stated that for polypharmacy to gain the attention of policymakers, a proposal from a group of experts would help significantly.

Creating teams and strategic vision

Participants were eagerly expressing the strategic vision of development of polypharmacy guidelines in Poland. The basic team to support patient medication care should be the pharmacist working in partnership with the physician. Information exchange between healthcare professionals should preferably be based on information technology systems which would provide linked systems with web based applications. The full team may include a physician, pharmacist, nurse, dietician and a physiotherapist. Many other professionals may contribute to the final polypharmacy management programme including healthcare professionals, healthcare providers, patient societies, specialists, specialist societies, and healthcare foundations. There is an urgent need for a special European Union body to set standards for polypharmacy management which harmonise treatment across member states based on global regulations. A separate working group at national level would be responsible for developing solutions regarding polypharmacy management and presenting it to policymakers.

Creating practice models

Lack of communication between physicians and pharmacists was identified as a major problem in current practices. Enabling change of medication formulation and reimbursement of prescribed drugs by pharmacists are long awaited features. At the moment more and more medications are being registered as over the counter treatment, which leads to loss of professional oversight of patient’s medications by physicians but provides an increased opportunity for pharmacists to offer counselling and advice. Patients would also benefit from healthcare cards (electronic or paper) gathering up-to-date data on prescribed medications enabling physician and pharmacist revision of medications. When patients believe in medications prescribed by medical professionals physician they may not be willing to withdraw medications prescribed by them.

Building sustainability

According to conducted case studies the polypharmacy management programme should initially be targeted at older patients and later incorporate other age groups. Implementation should start in small groups of patients as a trial, instead of the whole country at once. Electronic patient data when available should be used for analysis in order to improve implementation of the polypharmacy management programme in Poland.

Implementation of such a programme should be preceded by a media campaign promoting the programme with experts, the general public and patients. Specific regulations should be developed. A system of incentives for family physicians was mentioned by one of the interviewees. A pilot study of polypharmacy management programmes was proposed, which may be conducted in family physician’s practices in cooperation with geriatric out-patient clinics or geriatric wards. If the concept of multidisciplinary teams is preferred, such teams should be formed in small regions (e.g. province) in order to conduct a pilot study. Trainings about the programme and the ways of searching polypharmacy related knowledge on the Internet would be beneficial for healthcare professionals.
The first patients to be covered by a polypharmacy management programme are elderlies – if the resources are limited - this is the group of patients on which the programme should be focused.

Polish healthcare systems are lack an electronic database which could include data on the number of consumed medications by patient, divided into those which are necessary or not for the patient, hence a system for appropriate polypharmacy plus adherence.

**Conclusions**

The case study revealed many barriers to the way to implement polypharmacy management in Poland. The main conclusions were that:

- There is an urgent need to create awareness among policymakers and stakeholders about effective polypharmacy management.
- A coalition of institutions/governmental bodies responsible for the implementation of any polypharmacy management programme should be formed.
- A well-planned strategic vision of polypharmacy management should be proposed.
- A number of stakeholders should be enlisted to support implementation of polypharmacy management in Poland.
- The barriers for polypharmacy management programmes should be removed e.g. healthcare e-cards prepared for every patient, enabling revision of medications by physicians and pharmacists with e-card access.
- A pilot study should be designed to test implementation of the programme.
- This acceleration should be sustained by expanding the programme to the whole country, beginning with the elderly should ultimately be the next step toward embracing all patient groups.
- The change should be applied by dissemination of polypharmacy management programme to all stakeholders including healthcare professionals, healthcare providers, patients’ societies, specialists, specialist societies and foundations.
6.1.9 Case Study Summary Greece

Summary

Inappropriate polypharmacy issues have emerged in various settings and geographic areas in Greece, but efforts to articulate them and sensitize the public have been isolated rather than systematic so far. Although e-prescription implementation is widespread (≈98% coverage nationwide) and disease-specific guidelines (therapeutic protocols) have been developed, e-prescription still remains in the “data recording” stage, polypharmacy management is only associated with direct economic indicators, and medication review policies, pharmacovigilance and reliable reporting (alert) systems are scarce or absent. Health spending has dropped since 2009, as a result of government-wide efforts focused on reducing the large budgetary deficit. Medication safety is not adequately taken into account and dispensing of OTC medicines through enterprises other than pharmacies may endanger prudent use of medicines (1).

Electronic Patient Health Record and e-prescription data analysis have not been incorporated into the National Healthcare System infrastructure. Incentives and opportunities for participation in polypharmacy management and medication adherence programmes for health professionals or patients are fundamental. Collaboration of all stakeholders in healthcare, the establishment of the “case/care manager” and patient education remain unexploited drivers for change. Lack of coordination of institutions and authorities and overlap of their responsibilities, gaps in health care policies, healthcare workforce and infrastructure shortages, Primary Healthcare insufficiencies and cultural issues have become key barriers to the development of a strategic plan and the implementation and evaluation of relevant policies.

Structured, comprehensive programmes and national, regional or local policies, guidelines and legislation regarding polypharmacy management and medication adherence have not yet been developed. In contrast, healthcare professionals design and participate in initiatives of medication management activities with the primary motive of improving their practice for their patients. However, these activities are local, restricted to health professionals and patients that wish to participate, are not reimbursed, are not supported by the state and are not scaled up.

There is an urgent need to implement a polypharmacy management policy, by following both ‘top-down’ (from the State) and ‘bottom-up’ (from the society) approaches. This case study provides valuable insight into why there are not any policies regarding polypharmacy and adherence in Greece how relevant programmes could be developed, implemented and evaluated; and, explores which barriers and facilitators could have an impact on change.

Characteristics of the case study

Name of the programme
Polypharmacy Management Policies in Greece

Locality/region and country
Greece (Hellenic Republic) – Nationwide

Health care system overview
The Greek National Healthcare System is mixed financed (Beveridge + Bismarck) (2). The state participates in the budget with 29%, social insurance by 39% and the private sector by 32%. Decisions
on health issues are centralised. Physicians have been prescribing, mainly through e-prescription, since 2010. Pharmacists dispense the medication, nurses provide care and all other health professionals provide support. Patients participate in the cost of their medication in a range of 0%, 10%, 25% to 100%, depending on the disease, medicine group and health insurance coverage. Reviews of medication records, patient education and advice on medicines are provided voluntarily by medical doctors and/or pharmacists. The healthcare system is generally characterised by an oversupply of doctors and a shortage of nurses, which causes operational and service distortions and supplier-induced demand phenomena. Moreover, health spending has dropped since 2009, as a result of government-wide efforts focused on reducing the large budgetary deficit.

**Programme aims and objectives**

There are neither structured, comprehensive programmes nor are there regional or local policies, guidelines and legislation, regarding polypharmacy and medication adherence, in Greece. The widespread implementation of e-prescription has rationalised and modernised medicine prescription and facilitated the decrease of pharmaceutical costs in the country, ensuring smooth and safe information exchange among prescribing healthcare professionals, pharmacists and social insurance institutions. However, statistical outputs delivered by e-prescription have not yet been utilised for the designing of a national strategic plan, focused on polypharmacy.

Regrettably, polypharmacy is not always sufficiently justified and appropriate. Although single disease-oriented therapeutic protocols have been developed, in practice their implementation is not monitored and is not linked either to treatment or appropriate polypharmacy. Therefore, there are often incidents of harmful drug interactions and contraindications being overlooked, as well as multiple, usually dose-dependent, side effects. Medication personalisation and cost/benefit ratio for each patient is not usually evaluated or taken into consideration.

In the absence of a formal policy and/or programme, some contributions are coming from different professional groups in healthcare that choose to provide better services to their patients and perform medication reviews and medicines optimisation, including:

- Community pharmacists offer pharmaceutical care to patients and this service includes management of prescribed medication, OTC remedies, vitamins and supplements and food-drug interactions.
- Hospital pharmacists in some state (public) hospitals review medication for inpatients and out-patients, communicate with prescribers and confirm the "benefit-no harm" principle in the prescribed medication (e.g. incompatibilities, side effects, 7-rights of medication).
- Medical doctors, mostly general practitioners and some specialised ones, usually in primary healthcare settings, keep health records of their patients and have an overview of all administered medication.

All the above initiatives are provided without motivation by national policies or guidelines. Therefore, they rely on the willingness of the health professionals to address pharmacotherapy more rationally and prudently. They include, but they do not focus on, polypharmacy management and they are not necessarily representative of what is happening nationwide.

**Institutions included in case study**

The following institutions, government bodies, societies and associations could contribute to the development, implementation and evaluation of polypharmacy management policies and were, therefore, included in the case study:
• Hellenic Ministry of Health, e.g. the Direction of Pharmaceutical Policy and the 1st Regional Healthcare Authority of Attica (1stRHA/1stYPE).
• EOPYY, the National Organisation for the Provision of Health Services.
• IDIKA SA, the e-governance in Social Insurance (public body), which is the national competence centre, responsible for providing technical support for the implementation of electronic prescription at national level.
• EOF: the National Drug Organisation.
• Healthcare Professionals’ Societies and Associations, e.g. the Athens Medical Society, the Panhellenic Association of Pharmacists, the Hellenic Society of Pharmaceutical Practice (HSPP).
• Patients Societies and Associations, e.g. Greek Alliance for Rare Diseases, Hellenic Diabetes Federation, Greek Federation of Kidney Patients, etc.

Managerial and policy highlights of the programme

Moving from importance to urgency

The development and implementation of a polypharmacy management programme in Greece is not just important, it is urgently needed, but faces multiple barriers. At present, there is a lack of a strategic plan for the development, implementation and evaluation of relevant policies. Authorities and/or institutions are not sufficiently interested to support, or participate effectively, in such a programme.

Key barriers to the development, implementation, and scale up of a polypharmacy and adherence programme remain the fragmented and duplicated healthcare system and the “hospital-centred” care as the predominant type of care delivery.

Co-operation between health professionals is practically non-existent and promotion of collaboration encounters substantial resistance. Incentives and opportunities for participation in polypharmacy management and medication adherence programmes are not offered either to health professionals or to patients. Although the problem of polypharmacy has been articulated and often presented, its management is associated with only direct economic indicators, especially since the onset of the fiscal crisis, and the parameters of medication safety are not adequately taken into account.

The nationwide implementation of e-prescription in our clinical practice is potentially a valuable tool in providing integrated and co-ordinated health care (Integrated Care) and a lot of expectations for its use in this direction have been developed (3). But it still remains in the “data recording” stage, without the possibility of establishing "critical and smart" relationships for each patient and thus substantial support for complex treatment options.

A polypharmacy management policy could be implemented in the country with proper mobilisation, through both a ‘top down’ approach from the State and ‘bottom up’ approach from the society.

Creating teams and strategic vision

Collaboration of all stakeholders in the management of polypharmacy is essential, in order to address communication gaps and counter confusion on procedures regarding medication management in general. Health professionals, academia, governmental institutions, policy makers and patients need to create a coalition, so that decisions in health are inspired and influenced by discussions rather than imposed by professionals on citizens.
Primary healthcare in our country has experienced many reforms during the last decade and groups of healthcare professionals “show the way” to citizen-centred healthcare by taking initiatives to “connect the dots” of a patient’s journey into healthcare services, and by “building bridges” rather than “raising borders”. Since 2013, the Hellenic Society of Pharmaceutical Practice (HSPP) has been supporting pharmacists that wish to improve their daily clinical practice, so that it responds to the needs of the patients, the society and the country. Community and private pharmacies have taken initiatives towards medicines optimisation and they still remain a point of reference for medication management, as citizens visit them more often and more easily than making an appointment with a medical doctor. This fact facilitates the implementation of a polypharmacy management programme in the community setting, as an initial step.

Creating practice models

Human healthcare workforce shortages and healthcare infrastructure deficiencies are the main barriers to the development and implementation of healthcare related policies and programmes. Health care policies also encounter multiple barriers in development, implementation and especially evaluation. There is a general feeling of the existence of a “if you cannot convince them, confuse them” (sic, focus group session) attribute, when it comes to implementation. Coordination of institutions and authorities is non-existent and the overlap of their responsibilities usually hinders policy implementation. A programme for polypharmacy management could be useful but is very difficult to develop, implement and evaluate in a country that lacks other fundamentals in healthcare, such as implemented therapeutic and clinical protocols and is characterised by fundamental gaps in the primary health care sector. The lack of established and functional primary health care services fuels polypharmacy in the country.

Medication surveillance and pharmacovigilance are not effective and reliable reporting (alert) systems as these have not yet been sufficiently developed and implemented. Moreover, there is the emerging danger of dispensing OTC medication through enterprises other than pharmacies, conforming to recently voted legislation, which was enacted under the pressure of the fiscal crisis and the stewardship of Greece by foreign institutions.

The development and implementation of the Electronic Patient Health Record is essential to build on the success of the e-prescription project. E-prescription is a useful tool, but, so far, it has been limited to data collection rather than data analysis and reporting.

Cultural barriers are important as people can appear uncooperative in implementing rules and regulations and seek ways to bypass them, as they usually feel that they are imposed on them.

Collaboration of all stakeholders in the management of polypharmacy can be difficult in Greece because “everybody and nobody” (sic, focus group session) are responsible for effective prevention, treatment and management of diseases. It is not clear who is the “case/care manager” for each citizen/patient that receives health care services. In addition, health professionals’ communication and collaboration is optional rather than culturally and professionally supported.

Patient education on adherence and inappropriate polypharmacy management is essential as patients usually exert pressure on health professionals to have medication prescribed and dispensed. However, the lack of coordination (who, how, where, what type) to provide such education is evident. Furthermore, issues of uniformity of patient education are raised, mainly due to health professionals holding different views and perceptions of evidenced-based care which is usually provided through improvisation rather than SOPs (standard operational procedures).
Building sustainability

Sustainability of a polypharmacy management programme could be achieved. A polypharmacy management programme would decrease the cost of medication and the burden of disease, leading to improvements in the health of the population and the healthcare infrastructure and personnel availability. Consequently, an acceleration and establishment of change in polypharmacy management could be observed, if all the above could be sufficiently demonstrated to all stakeholders. However, whether these short-term and long-term wins would be evaluated by polls, surveys, questionnaires or other means, is still identified.

Conclusions

As it has become apparent, currently, there is neither a polypharmacy nor an adherence to medication management programme, in Greece. Clear policies regarding inappropriate polypharmacy and adherence do not exist.

Development, implementation and evaluation of such programmes require collaboration and partnerships among all stakeholders, which are still difficult to accomplish. The Hellenic Society of Pharmaceutical Practice (HSPP), whose activities are described as an example of a good practice, fills gaps in the continuity of care, mainly at primary healthcare level. However, these activities are local, are restricted to health professionals and patients that wish to participate, are not reimbursed and are not scaled up.

Decisions regarding healthcare policy and management of resources are “top down” and are mainly influenced by the current fiscal crisis. Seamless healthcare is not provided through coordination among involved institutions, but through isolated initiatives of healthcare professionals wishing as their primary motive to improve their practice for their patients.

Health information technology infrastructure to support implementation and monitoring of a programme exists, but it is limited to collecting data rather than transforming the data into valuable information regarding medication management and improved healthcare services.

Policy makers, health system administrators and managers have no role in facilitating (or hindering) the development and implementation of a polypharmacy and adherence programme, as they are engaged in other activities, like budget management and efforts on health expenditure reduction.

Although legislation is abundant regarding healthcare, coordination of provided services and effective deployment of human resources is in shortage. Health professionals are trained in disease management focusing on their specific scientific fields, but have limited interaction with each other. Medication management is restricted to management of over-prescription in order to reduce medication reimbursement by the state. Healthcare societies and associations may offer suggestions and develop plans for cost-effective pharmacotherapy that respect the patients’ right to quality health services, but often counsellors and state or/and EU appointed committees influence the government in making decisions based only and predominantly on financial outcomes and indicators. Adherence to treatment or/and appropriate polypharmacy seems to be a “luxury” to decision makers, in such a context.

References


6.2 Country data profiles 2013/15


Source for EU-28 average data (where available): the Eurostat database (http://ec.europa.eu/eurostat/data/database)

GDP data refer to 2014; for all other variables, the reference year is 2013, unless differently indicated
### Table 6 Economic Indicators, 2013/14

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<tbody>
<tr>
<td><strong>GDP, in million USD PPPs, 2014</strong></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>3,641,590.4</td>
<td>1,579,061.3</td>
<td>2,552,152.1</td>
<td>288,293.7</td>
<td>2,144,875.3</td>
<td>952,892.4</td>
<td>295,822.0</td>
<td>444,212.7</td>
<td></td>
</tr>
</tbody>
</table>

| **GDP per capita, in USD PPPs, 2014** |        |        |        |        |        |        |        |        |        |
|                                       | 44,999.6 | 34,369.8 | 39,821.0 | 25,331.4 | 35,283.9 | 25,051.7 | 28,513.5 | 45,799.8 | 36,114.0 |

| **GDP, current prices, MAGR (%) between 2009-2014** |        |        |        |        |        |        |        |        |        |
|                                                     | 3.7    | 0.8    | 2.5    | -3.3   | 1.2    | 5.5    | 1.3    | 3.8    | 1.4    |

| **Employment/population ratio (%) (15-64 years old), 2013** |        |        |        |        |        |        |        |        |        |
|                                                          | 73.8   | 56.8   | 72.6   | 49.4   | 56.5   | 61.7   | 62.6   | 74.9   | 68.4   |

| **Unemployment rate (%), in population 15-64 years old, 2013** |        |        |        |        |        |        |        |        |        |
|                                                              | 5.1    | 24.6   | 6.4    | 26.7   | 12.9   | 9.1    | 14.5   | 8.1    | 10.9   |

| **Health care coverage as a % of total population: Government/social health insurance, 2013** |        |        |        |        |        |        |        |        |        |
|                                                                                       | 88.8   | 99*    | 100.0  | 79     | 100.0  | 91.6   | 100.0  | 100.0  |        |

| **Total private health insurance as % of total population, 2013** |        |        |        |        |        |        |        |        |        |
|                                                                | 33.0   | -      | 10.6   | 12.5   | -      | 0.0    | 21.1   | -      | -      |

| **Total health expenditure as % of GDP, 2013** |        |        |        |        |        |        |        |        |        |
|                                               | 11.0   | 8.8    | 8.5    | 9.2    | 8.8    | 6.4    | 9.1    | 11.0   | -      |

| **Health expenditure, current prices, MAGR (%) between 2008-2013** |        |        |        |        |        |        |        |        |        |
|                                                                   | 3.9    | 1.0    | 2.4    | -5.1   | 0.9    | 5.7    | 0.4    | 8.0    | -      |

| **Total health expenditure, per capita, current prices, USD PPPs, 2013** |        |        |        |        |        |        |        |        |        |
|                                                                       | 4,818.9 | 2,898.4 | 3,234.8 | 2,366.4 | 3,076.6 | 1,530.2 | 2,514.4 | 4,904.1 | -      |

| **Public health expenditure as % of total health expenditure, 2013** |        |        |        |        |        |        |        |        |        |
|                                                                    | 76.3   | 71.5   | 86.6   | 65.5   | 77.4   | 70.6   | 66.6   | 84.1   | -      |

| **Total pharmaceutical expenditure as % of GDP, 2013** |        |        |        |        |        |        |        |        |        |
|                                                       | 1.5    | 1.6    | 1^      | 2.8    | 1.6    | 1.4    | 1.4    | 1.1    | -      |

| **Pharmaceutical expenditure, current prices, MAGR (%) between 2008-2013** |        |        |        |        |        |        |        |        |        |
|                                                                     | 2.1    | 1.3    | -      | -4.3** | 0.3    | 3.0    | -5.6   | 1.7    | -      |

| **Total pharmaceutical expenditure as % of health expenditure, 2013** |        |        |        |        |        |        |        |        |        |
|                                                                       | 14.1   | 18.8   | 12.3^   | 30.5   | 18.6   | 21.6   | 15.6   | 10.1   | -      |

| **Public pharmaceutical expenditure as % of health expenditure, 2013** |        |        |        |        |        |        |        |        |        |
|                                                                      | 10.5   | 11.4   | 10.4^   | 20.3   | 9.2    | 6.9    | 8.5    | 5.3    | -      |

* **GDP**: Gross Domestic Product; **PPPs**: purchasing power parities; **MAGR**: mean annual growth rate. * 2011 ^ 2008 **2009-2013
### Table 7 Healthcare system key indicators, 2013

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<thead>
<tr>
<th>Indicator</th>
<th>DE</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Total hospital beds per 1000</td>
<td>8.3</td>
<td>3.0</td>
<td>2.8</td>
<td>4.8*</td>
<td>-</td>
<td>6.6</td>
<td>3.4</td>
<td>2.6</td>
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<tr>
<td>Long term care beds per 1000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.0</td>
<td>-</td>
<td>0.2</td>
</tr>
<tr>
<td>Practicing physician per 1000 population</td>
<td>4.1</td>
<td>3.8</td>
<td>2.8</td>
<td>6.3†</td>
<td>3.9</td>
<td>2.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Practicing pharmacists per 1000 population</td>
<td>0.6</td>
<td>1.1</td>
<td>0.8</td>
<td>-</td>
<td>-</td>
<td>0.7</td>
<td>0.8</td>
<td>-</td>
</tr>
<tr>
<td>Physicians employed in hospital per 1000 population</td>
<td>2.2</td>
<td>2.2</td>
<td>-</td>
<td>2.5*</td>
<td>2.1 **</td>
<td>1.1</td>
<td>2.0 **</td>
<td>-</td>
</tr>
<tr>
<td>Number of general practitioners per 1000 population</td>
<td>0.7</td>
<td>0.8</td>
<td>0.8</td>
<td>0.3</td>
<td>0.8</td>
<td>0.2</td>
<td>0.6</td>
<td>-</td>
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<tr>
<td>Number of specialist physicians per 1000 population</td>
<td>2.4</td>
<td>2.4</td>
<td>2.0</td>
<td>3.8</td>
<td>3.0</td>
<td>1.9</td>
<td>2.2</td>
<td>-</td>
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<tr>
<td>Number of nurses per 1000 population</td>
<td>13.0</td>
<td>5.1</td>
<td>8.2</td>
<td>3.7^</td>
<td>-</td>
<td>5.3</td>
<td>-</td>
<td>-</td>
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<tr>
<td>Long Term Care recipients in institutions (other than hospitals) as % population 65 years</td>
<td>8.4</td>
<td>5.0</td>
<td>-</td>
<td>-</td>
<td>4.8</td>
<td>-</td>
<td>0.6</td>
<td>11.4</td>
</tr>
<tr>
<td>Long Term Care recipients at home as % population 65 years</td>
<td>4.0</td>
<td>1.8</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.8</td>
<td>1.1</td>
<td>4.9</td>
</tr>
</tbody>
</table>

*2011, ** 2012


† 2013 data, Source: Hellenic Statistical Authority (www.statistics.gr)
Table 8 Life expectancy. Morbidity indicators, 2013

<table>
<thead>
<tr>
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<th>DE</th>
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<th>UK</th>
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<th>EU -28 average</th>
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<tr>
<td>Life expectancy at birth</td>
<td>80.9</td>
<td>83.2</td>
<td>81.1</td>
<td>81.4</td>
<td>82.8</td>
<td>77.1</td>
<td>80.8</td>
<td>82.0</td>
<td>77.8 * 83.3 †</td>
</tr>
<tr>
<td>Life expectancy at 65 (male)</td>
<td>18.2</td>
<td>18.6</td>
<td>18.6</td>
<td>18.7</td>
<td>18.9</td>
<td>15.5</td>
<td>17.8</td>
<td>18.8</td>
<td>17.9</td>
</tr>
<tr>
<td>Life expectancy at 65 (female)</td>
<td>21.1</td>
<td>23.4</td>
<td>20.9</td>
<td>21.6</td>
<td>22.6</td>
<td>19.9</td>
<td>21.6</td>
<td>21.3</td>
<td>21.3</td>
</tr>
<tr>
<td>Life expectancy at 80 (male)</td>
<td>8.5</td>
<td>9.1</td>
<td>8.5</td>
<td>8.9</td>
<td>8.6</td>
<td>7.5</td>
<td>7.8</td>
<td>8.2</td>
<td>-</td>
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<tr>
<td>Life expectancy at 80 (female)</td>
<td>9.5</td>
<td>11.2</td>
<td>9.7</td>
<td>9.7</td>
<td>10.7</td>
<td>9.3</td>
<td>9.8</td>
<td>9.7</td>
<td>-</td>
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<tr>
<td>Healthy Life Years at age 65+</td>
<td>7.0</td>
<td>9.7</td>
<td>10.6</td>
<td>8.0</td>
<td>7.7</td>
<td>7.2</td>
<td>9.6</td>
<td>12.9</td>
<td>8.5</td>
</tr>
<tr>
<td>Healthy Life Years at age 65+</td>
<td>7.0</td>
<td>9.0</td>
<td>10.7</td>
<td>6.8</td>
<td>7.1</td>
<td>7.8</td>
<td>9.3</td>
<td>13.8</td>
<td>8.6</td>
</tr>
<tr>
<td>Mortality from NCDs as a % total deaths</td>
<td>91.0</td>
<td>92.0</td>
<td>89.0</td>
<td>91.0</td>
<td>92.0</td>
<td>90.0</td>
<td>86.0</td>
<td>90.0</td>
<td>-</td>
</tr>
<tr>
<td>Perceived health status total aged 15+ as % of total population (Good/very good health)</td>
<td>64.9</td>
<td>71.6</td>
<td>73.7</td>
<td>73.9</td>
<td>66.1</td>
<td>58.3</td>
<td>46.1</td>
<td>81.1</td>
<td>67.1</td>
</tr>
</tbody>
</table>

NCDs: Non-communicable diseases

^ Source: WHO database (http://www.who.int/gho/ncd/mortality_morbidity/en/); * male; † female
### Table 9 Socio-demographic indicators, 2013

<table>
<thead>
<tr>
<th></th>
<th>DE</th>
<th>ES</th>
<th>UK</th>
<th>GR</th>
<th>IT</th>
<th>PL</th>
<th>PT</th>
<th>SE</th>
<th>EU-28</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>80,645,610</td>
<td>46,593,240</td>
<td>63,237,940</td>
<td>11,090,000*</td>
<td>61,178,360</td>
<td>38,533,790*</td>
<td>10,457,300</td>
<td>9,609,000</td>
<td>505,127,210</td>
</tr>
<tr>
<td>Population projections in 2020</td>
<td>81,481,500</td>
<td>46,071,460</td>
<td>66,754,050</td>
<td>11,425,950</td>
<td>62,497,030</td>
<td>37,829,890</td>
<td>10,197,220</td>
<td>10,256,000</td>
<td>512,474,771</td>
</tr>
<tr>
<td>Distribution of population over 65 as % of total population</td>
<td>21.1</td>
<td>17.7</td>
<td>17.1</td>
<td>20.2</td>
<td>21.0</td>
<td>14.4</td>
<td>19.4</td>
<td>19.0</td>
<td>18.2</td>
</tr>
<tr>
<td>Old (+65) Dependency Ratio (15-64)</td>
<td>32.5</td>
<td>26.8</td>
<td>26.0</td>
<td>30.4*</td>
<td>32.2</td>
<td>20.5</td>
<td>29.9</td>
<td>31.3</td>
<td>27.5</td>
</tr>
<tr>
<td>Upper secondary education, as % of total population</td>
<td>24.0^</td>
<td>71.1</td>
<td>-</td>
<td>-</td>
<td>77.7</td>
<td>86.5</td>
<td>100.9</td>
<td>79.5</td>
<td>75.2‡</td>
</tr>
<tr>
<td>Total tertiary education excluding doctoral level as % of total population</td>
<td>36.2</td>
<td>52.4</td>
<td>32.0</td>
<td>-</td>
<td>34.5</td>
<td>-</td>
<td>42.9</td>
<td>40.7</td>
<td>-</td>
</tr>
<tr>
<td>Couple households with children as % of households*</td>
<td>20.6</td>
<td>30.4</td>
<td>22.4</td>
<td>27.9</td>
<td>27.1</td>
<td>28.9</td>
<td>31.3</td>
<td>24.3</td>
<td>-</td>
</tr>
<tr>
<td>Couple households without children as a % of households*</td>
<td>31.2</td>
<td>29.9</td>
<td>28.4</td>
<td>30.6</td>
<td>27.9</td>
<td>23.7</td>
<td>32.3</td>
<td>27.9</td>
<td>-</td>
</tr>
<tr>
<td>Sole parent households as a % of households*</td>
<td>5.5</td>
<td>5.9</td>
<td>8.5</td>
<td>4.2</td>
<td>5.4</td>
<td>7.7</td>
<td>6.1</td>
<td>6.6</td>
<td>-</td>
</tr>
<tr>
<td>Single person households as a % of households*</td>
<td>37.3</td>
<td>23.2</td>
<td>30.6</td>
<td>25.7</td>
<td>31.1</td>
<td>24.0</td>
<td>21.4</td>
<td>36.2</td>
<td>-</td>
</tr>
</tbody>
</table>

* 2012; ‡ age group 25-64; ^ For Germany, data refer to “post-secondary, non-tertiary education”